THE

ST. LAWRENCE PILOT,

COMPRISING SAILING DIRECTIONS FOR THE GULF AND RIVER;

BY

REAR-ADMIRAL H. W. BAYFIELD, F.R.A.S.

BEING THE RESULT OF A SURVEY MADE BY ORDER OF THE LORDS COMMISSIONERS OF THE ADMIRALTY.

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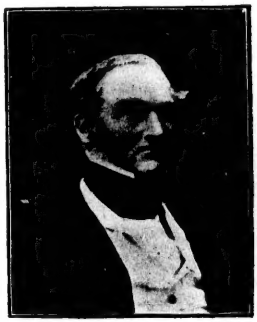

Admiral Bayfield.

ADVERTISEMENT

TO THE FOURTH EDITION.

THE St. Lawrence Pilot is intended to be used with the Admiralty Charts derived from the surveys made, by order of the Lords Commissioners of the Admiralty, between the years 1828 and 1860, by Captain, now Rear Admiral, H. W. Bayfield, Commander Orlebar, and their assistant officers. In it will be found directions for every part of the Gulf and River St. Lawrence, excepting the west coast of Newfoundland, which was surveyed by the celebrated navigator Cook in the last century.

The extent of coast thus described, reckoning from the Atlantic entrances of the Gulf to the termination of the ship navigation at Montreal, and including the circuit of the larger islands and bays, amounts to more than 3,000 miles. In this distance every diversity of coast will be found, from the barren granite shores of Labrador, fringed with numerous islets, rocks, and ledges, to the bold and precipitous shales and limestones of the southern shore westward of Gaspé; the coal measures of New Brunswick, Nova Scotia, and Cape Breton; and the red sandstone so conspicuously displayed in Prince Edward island.

The first and second chapters of Vol. I. are devoted to general remarks on the nature of the navigation and the dangers to be guarded against arising from the ice, fogs, prevailing winds, tides, and currents. In the third chapter are given general directions for the principal line of navigation across the Gulf and up the Estuary of the St. Lawrence, from the main entrance between Newfoundland and Cape Breton islands to Green and Red islands, a distance of 500 miles. At this point the channel of the river becomes divided and narrow, and the tides so strong as to render the assistance of a pilot indispensable to a stranger ascending the St. Lawrence in a large ship for the first time.

In the fourth chapter a description is given of the islands lying in the route to Quebec, including St. Paul, Bird, Magdalen, and Anticosti islands; whilst the fifth chapter describes the southern shore of the Gulf and Estuary, from Cape Despair at the entrance of Chaleur bay to Green island. In these two chapters the objects and places referred to in the third chapter are described, and directions given for the harbours and anchorages.

In Chapter VI. will be found a description of the coast of Labrador from Cape St. Lewis to Grand point, including the Strait of Belle-isle. The next three chapters, VII., VIII., and IX., describe the northern coasts of the Gulf and Estuary, from the Strait of Belle-isle up to the entrance of the Saguenay river opposite to Green and Red islands. In these four chapters the coast is described from east to west, as it would be seen by a stranger entering the Gulf through the Strait of Belle-isle.

This latter route was formerly very seldom used, excepting by vessels engaged in the fisheries; but now, being the shorter passage, it is preferred by the Canada mail steamers during the summer months; and doubtless the aid of steam, and the lights on Belle-isle and Amour point, will greatly lessen the danger of the navigation.

The remaining three chapters refer to the pilot water of the St. Lawrence from Green and Red islands to the cities of Quebec and Montreal, and include the Saguenay river. In this part of the river many new buoys have been introduced, and above Quebec many new lights, since the publication of the former editions of this work.

Vol. II. contains the description of the southern entrance of the Gulf, through Chedabucto bay and the Gut of Canso, and all the southern parts of the Gulf, including Chaleur bay, the coasts of New Brunswick and Nova Scotia, and the islands of Prince Edward and Cape Breton.

I. W.

Hydrographic Office, Admiralty, London,
June 1860.

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THE

ST. LAWRENCE PILOT.

IN THIS WORK THE BEARINGS ARE ALL MAGNETIC, EXCEPT WHERE MARKED AS TRUE.

THE DISTANCES ARE EXPRESSED IN SEA MILES OF 60 TO A DEGREE OF LATITUDE.

A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO 100 FATHOMS.

THE DEPTHS ARE IN FATHOMS OR FEET REDUCED TO LOW WATER OF ORDINARY SPRING TIDES.

THE

ST. LAWRENCE PILOT.

PART I.

CHAPTER I.

GENERAL REMARKS.—The navigation of the Gulf and River of St. Lawrence has always been supposed to be attended with a considerable degree of difficulty and danger, and the numerous accidents which are constantly occurring to vessels there seem to show that the opinion is well founded. The want of soundings, in many parts, near the shores; the irregularity of the tides and currents; the severity of the climate, especially towards the close of the navigable season; and, above all, the frequent fogs, are difficulties which may well cause much anxiety in the mind of the seaman, and which call for the exercise of all his vigilance, prudence, and ability. Nevertheless, a large proportion of the losses which annually take place may justly be attributed to other than these natural and irremediable causes. Erroneous charts, a want of knowledge of the direction and strength of the tides and currents, and a false variation of the compass, are, although not the only, certainly the most frequent causes of shipwreck in the St. Lawrence. It is hoped that these last will be removed by the Admiralty survey, and by these directions and remarks, written to accompany that survey.

In the Admiralty charts will be found accurate soundings, taken with Massey's patent sounding machine, which gives the depth independent of the effect of currents or drift of the vessel. The use of this instrument cannot be too strongly recommended, for correct soundings may be obtained with it in 30 fathoms of water without heaving to, if the vessel be not

sailing at a rate exceeding 6 knots; and no vessel ought to be permitted to run so fast, in a thick fog or dark night, when in the vicinity of land or other danger. Furnished with this instrument, or, instead of it, with Burt's buoy and nipper, and with correct charts, a vessel may run in safety up the St. Lawrence as high as Green island. In short, there, as elsewhere, correct soundings are the best of all guides to the navigator.

The VARIATION, given in Des Barres' charts, was probably correct for the time when the charts were made, about 1760; and though greatly changed since, has been copied nevertheless into most of the charts in general use. For instance, in some of those charts the variation at Anticosti is given as 17° West, too little by three quarters of a point. The effect of this upon the run of a vessel from the entrance of the Gulf to Anticosti, or from the latter to Point de Monts, will be obvious to any seaman, and has doubtless occasionally been one cause of shipwreck.

The navigator is reminded that the amount of the variation of the compass differs nearly 24°, or two points, between the limits of the places described in this work; viz., at Belle-isle, 39°, and Quebec 15½°, at the beginning of the year 1860; as also that its annual change is comparatively great, amounting to an increase of 6 and 7 minutes annually.

The DEVIATION or local attraction of the compass needle is another source of error, independent of charts altogether, which it is astonishing to find obtaining so little attention, particularly in the merchant service, considering how much has been written concerning it of late years. This subject is one of great importance in approaching and navigating the Gulf, as from the increase of the magnetic dip, and the decrease in the horizontal magnetic force that is found here—two elements affecting the ship's magnetism—the original deviation of the compass, if determined in England will, in all probability, be much increased. In many vessels it has been ascertained by direct observation, that their maximum deviations have been increased by one third. Examples—*H. M. S. Pylades*, in England, 15°; at Sydney, Cape Breton island, 19½°. *H. M. S. Cyclops*, in England, 7½°; at St. Johns, Newfoundland, 10°.

MAGNETIC ATTRACTION of the SHORES.—An opinion is prevalent that the compasses of vessels are disturbed in the Gulf and River, and such disturbance has been attributed to the magnetic ores of iron in the hills, particularly those of the north coast. The magnetic oxide of iron does exist abundantly, and attracts the needle very powerfully at some points, particularly along the coast from the Bay of Seven Islands eastward. Among the Mingan islands, the variation was found to vary from this cause from 19° to 31° West. At Port Neuf, and on Manicouagon

point, the needle was also disturbed. But these effects were only noticed when the instrument was placed on the shore. In two instances only, when sailing within 2 miles of the shore, was any effect of the kind observed upon the compasses on board the *Gulnare*,* and then only to the amount of a few degrees.

When running from place to place, at greater distances from the coast, nothing of the kind was noticed; so that in nine cases out of ten where this source of erroneous reckoning has been alleged as the cause of accidents to vessels, they probably originated either in errors of the chart or in the local attraction on board the vessels themselves.

ICE.—Among the difficulties of the navigation may be mentioned the ice. In spring, generally in the month of May, the entrance and eastern parts of the Gulf are frequently covered with drift ice, and vessels are sometimes beset by it for many days. Being unprepared for contending with this danger, they often suffer from it, and are occasionally lost; but serious accidents from this cause do not frequently occur, because the ice is generally more or less in a melting state from the powerful effect of the sun in spring. In the fall of the year accidents from ice seldom happen, except when the winter commences unusually early, or when vessels have lingered imprudently late, from the temptation of obtaining high freights.

At Quebec, taking the mean of a number of years, the navigation is closed by ice from the 25th of November to the 25th of April. The earliest closing observed was on the 20th of November, and the earliest opening on the 15th of April. The St. Lawrence seldom freezes across opposite the city of Quebec, being kept open by the rapid tides in the comparatively narrow channel there; but in some of the years wherein an ice-bridge, as it is termed, has been formed, the opening of the navigation has been delayed until past the first week in May. As a general rule, the navigation is considered unsafe after the 15th of November or before the 25th April; and even after this last-named date, vessels are often embarrassed by drift ice, which, however, a steamer would probably often be able to force her way through.

As we proceed down the St. Lawrence, and across the Gulf towards the open Atlantic, the harbours are later in closing, and earlier in opening; except it be on the northern shores of the Gulf and of Newfoundland. At Charlottetown, Prince Edward island, taking the mean of ten years' observations, the harbour was closed by ice on the 21st of December, and opened on the 15th of April. In one of those years, the harbour was

* The schooner in which the Admiralty survey was carried on.

clear of ice on the 1st of April, and in another year it remained open until the 27th of December; but, as a general rule, the navigation is not considered safe even in this southern part of the Gulf after the first week in December, or before the 15th of April.

FOGS.—But all danger from ice is far less than that which arises from the prevalence of fogs: they may occur at any time during the open or navigable season, but are most frequent in the early part of summer; they are rare, and never of long continuance, during westerly winds, but seldom fail to accompany an easterly wind of any strength or duration. The above general observation is subject, however, to restriction, according to locality or season. Thus winds between the South and West, which are usually clear weather winds above Anticosti, are frequently accompanied with fog in the eastern parts of the Gulf. Winds between the South and East are almost always accompanied with rain and fog in every part. E.N.E. winds above Point de Monts are often E.S.E. or S.E. winds in the Gulf, changed in direction by the high lands of the south coast, and have therefore in general the same foggy character. Winds of considerable strength and duration are here meant, and which probably extend over great distances. Moderate and partial fine weather winds may occur without fog at any season and in any locality. In the early part of the navigable season, especially in the months of April and May, clear weather, N.E. winds are of frequent occurrence, and they also sometimes occur at other seasons, in every part of the Gulf and River.

The fogs sometimes last several days in succession, and to a vessel either running up or beating down, during their continuance, there is no safe guide but the constant use of the deep-sea lead, with a chart containing correct soundings.

The fogs, which accompany easterly gales, extend high up into the atmosphere, and cannot be looked over from any part of the rigging of a ship. They, however, are not so thick as those which occur in calms after a strong wind, and which are frequently so dense as to conceal a vessel within hail; whilst the former often, but not always, admit the land, or other objects, to be distinguished at the distance of half a mile, or more, in the daytime.

The dense fogs, which occur in calms, or even in very light winds, often extend only to small elevations above the sea; so that it sometimes happens, that when objects are hidden at the distance of 50 yards from the deck, they can be plainly seen by a person 50 or 60 feet up the rigging. In the months of October and November the fogs and rain that accompany easterly gales, are re-placed by thick snow, which causes equal embarrassment to the navigator.

WINDS.—The prevailing winds, during the navigable season, are either directly up or directly down the Estuary, following the course of the chains of high lands on either side of the great valley of the St. Lawrence. Thus a S.E. wind in the Gulf becomes E.S.E. between Anticosti and the south coast, E.N.E. above Point de Monts, and N.E. above Green island. The westerly winds do not appear to be so much guided in direction by the high lands, excepting along the south coast, where we have observed a W.S.W. wind at the island of Bic become West, W.N.W., and N.W., as we ran down along the high and curved south coast, until it became a N.N.W. wind at Cape Gaspé. These winds frequently blow strong for three or four days in succession; the westerly winds being almost always accompanied with fine, dry, clear, and sunny weather; the easterly winds as frequently the contrary, cold, wet, and foggy.

In the spring, the easterly winds most prevail, frequently blowing for several weeks in succession. As the summer advances, the westerly winds become more frequent, and the S.W. wind may be said to be the prevailing wind in summer in all parts of the River and Gulf. Light South winds take place occasionally; but North winds are not common in summer, although they sometimes occur. Steady N.W. winds do not blow frequently before September, excepting for a few hours at a time, when they generally succeed easterly winds which have died away to a calm, forming the commencement of strong winds, and usually veering to the S.W. The N.W. wind is dry, with bright clear sky, flying clouds, and showers. After the autumnal equinox, winds to the northward of West become more common, and are then often strong steady winds of considerable duration. In the months of October and November the N.W. wind frequently blows with great violence in heavy squalls, with passing showers of hail and snow, and attended with sharp frost.

Thunder storms are not uncommon in July and August; they seldom last above an hour or two; but the wind proceeding from them is in general violent and sudden, particularly when near the mountainous part of the coast; sail should, therefore, be fully and quickly reduced on their approach.

Strong winds seldom veer quickly from one quarter of the compass to another directly or nearly contrary: in general they die away by degrees to a calm, and are succeeded by a wind in the opposite direction. It is not meant, however, by this observation, that they may not veer to the amount of several points. N.W. winds seldom or never veer round by North and N.E. to East and S.E.; but they do frequently, by degrees, to the S.W., after becoming moderate. S.W. winds seldom veer by the N.W. and North to the eastward, but sometimes by the South to S.E. and East.

Easterly winds generally decrease to a calm, and are succeeded by a wind from the opposite direction.

In the fine weather westerly winds of summer, a fresh top-gallant breeze will often decrease to a light breeze or calm at night, and spring up again from the same quarter on the following morning: under these circumstances only may a land breeze off the north coast be looked for. The same has been observed off the south coast also, but not so decidedly or extending so far off shore. The north land wind may occasionally be carried nearly over to the south coast just before daylight, but the south land wind seldom extends more than five or six miles off, and that very rarely. Under the same circumstances, that is with a fine weather westerly wind going down with the sun, a S.W. land breeze will frequently be found blowing off the north coast of Anticosti at night and during the early part of the morning. If, however, the weather be not settled fair, and the wind does not fall with the sun, it will usually prove worse than useless to run a vessel close in shore at night in the hope of a breeze off the land.

Such is the usual course of the winds in common seasons, in which a very heavy gale of wind will probably not be experienced from May to October, although close-reefed topsail breezes are usually common enough. Occasionally, however, there are years, the character of which is decidedly stormy. Gales of wind, of considerable strength, then follow each other in quick succession and from opposite quarters.

BAROMETER.—The marine barometer, which is at all times of great use to the navigator, becomes particularly so in such seasons; and the following remarks upon its general indications, when taken in connexion with the usual course of the winds and weather in the St. Lawrence, may, therefore, be useful. The barometer has ordinarily a range from 29 to 30·5 inches in the Gulf and River during the navigable season, and its changes accompany those of the winds and weather with a considerable degree of constancy. The fluctuations of the barometric column are much greater and more frequent there than in lower latitudes; and sudden alternations, which in other climates would be alarming, may occur there without being followed by any corresponding change either in the wind or weather. But the navigator should not be inattentive to those minor changes, as a constant attention to the instrument can alone enable him to appreciate those decisive indications of the mercury which seldom or never prove deceptive. The following remarks will apply to those well marked changes which usually indicate the approach of a gale of considerable strength, or of a shift of wind and weather; the correct anticipation of which is often of the utmost consequence to the safety of a vessel, as well as to the length of her voyage.

When, after a continuance of westerly winds and fine weather, the barometer has risen nearly to its greatest height, say some tenths above 30 inches, or begins to fall a little, an easterly wind may be soon expected. If to this notice given by the barometer be added a warm hazy atmosphere during the day, and a heavy precipitation of dew at night, with very bright twinkling stars, or a coloured aurora borealis, the approach of a southerly or an easterly wind is almost certain. If land be in sight at such a time, and appears much distorted by terrestrial refraction, or if vessels in sight have the relative proportions of their hull and sails changed by the *mirage*, or present double or treble images, such appearances will render the before probable indications of the barometer certain. At the commencement the southerly or easterly wind will probably be light with fine clear weather, but this will not last above a few hours if the barometer continues to fall; on the contrary the wind will gradually increase, and as it does so the sky will become overcast by degrees until it is completely clouded. Rain and fog will follow, and continue during the continuance of the southerly or easterly wind with little intermission, until they are dissipated by a fresh breeze from the contrary quarter.

If the fall of the barometer, during the continuance of the southerly or easterly wind, be very slow, the gale will probably continue, and not be violent: if rapid, it will probably be of short duration, and of greater strength: at any rate, when the mercury falls towards 29 inches, a change is certainly at hand, and the gale will in general come from the N.W. The strength of this succeeding gale will be in proportion to the fall of the barometer, and to the strength of the southerly or easterly gale which preceded it. In such a case there is seldom many hours interval between the one gale and the other. The southerly or easterly wind generally dies away to calm, and in a very few hours, or sometimes in much less time, the N.W. gale springs up. A heavy cross sea remains for some time from the previous gale.

The barometer sometimes begins to rise in the interval of the calm which precedes the N.W. gale, at others at its commencement; the fog and rain cease, and the weather becomes quite clear, generally in a few hours, and sometimes almost immediately. The strength of the westerly gale is usually greatest soon after its commencement, and diminishes as the barometer rises, veering gradually to the West and S.W. It is worthy of remark, that the circumstances just mentioned are exactly the reverse of those attending the easterly gale. The latter usually commences with clear weather and a high barometer, light at first from the South or S.E., and gradually increasing as it veers to the eastward, with a falling barometer.

To return to the westerly gale. If, after it has veered to S.W. and become moderate, the barometer remains steady at a moderate height, fine weather may be expected. If it remains at a considerable height, but still fluctuating and unsteady, within certain limits, variable, but not heavy winds, and variable weather may be expected. If, on the contrary, it rises quickly to a great height, a repetition of the southerly or easterly gale will not be improbable. Seasons have been experienced in which the barometer may be said to have been no sooner blown up by one wind, than it has been blown down by another, and this stormy alternation to have continued for several months, whilst in others there has been scarcely a double-reefed top-sail breeze during the whole summer.

There is in fact so great a difference in the phenomena of the weather in different seasons, that it becomes difficult to write anything respecting it that shall not be liable to many exceptions. There are, however, some strongly marked cases of connexion between the indications of the barometer and changes of the winds and weather which have been subject to few, or almost no exceptions. The first of these cases is that most common one, of a southerly or an easterly gale, with a falling barometer, being always wet and foggy, and succeeded by a strong wind from the opposite quarter, with a rising barometer, and fine weather. A second case, not of so frequent occurrence in common seasons, excepting in spring or early in summer, is the north-east wind with a rising barometer; which, although it may not be at first for a few hours, will almost always become fine and clear, and end in fine weather. A third case may be considered certain: if the barometer fall suddenly and greatly at any time, a northerly, and most probably a N.W. gale, of great strength may be confidently expected. It does not follow that it will be immediate, for it may be preceded by a strong gale from S.W. for a few hours, during which the barometer will seldom rise, and even, probably, continue to fall; but when the S.W. gale dies away the northerly or N.W. will soon succeed, with a rising barometer.

In conclusion, it may be remarked, that as, on the one hand, a considerable fall of the barometer may occur without being followed by a strong wind, so, on the other, a breeze of considerable strength may come on without any indication from the barometer; but not anything that deserves the name of a gale. There has never, within our experience, occurred a gale so heavy as to be of serious consequence to a good vessel, the approach of which has not been indicated by the barometer. But it must be remembered that a high barometer in this climate, and under the circumstances which have been mentioned, is often indicative of a southerly or an easterly gale. It is remarkable that in the Gulf and Estuary of the St. Lawrence a high barometer may be considered as the forerunner of wet and foggy

weather, which usually accompanies its fall; whilst a low barometer renders it equally probable that dry weather will ensue, since it as often accompanies its rise. The marine barometer, therefore, is of the greatest assistance in the navigation of the Gulf and River; and by attending constantly to its state and changes, with reference to the winds and weather which preceded them, combined with the indications afforded by the appearance of the sky, &c., those changes of the wind and weather which are about to take place may be anticipated with a degree of certainty sufficient, in most cases, to enable a vessel to avoid being caught on a lee-shore or in an unsafe anchorage, as well as to regulate her course in anticipation of the coming change.

CHAPTER II.

CURRENTS AND TIDAL STREAMS IN THE GULF AND RIVER OF ST. LAWRENCE.

CURRENTS.—The time of high water at full and change, at different places, will be found in the Table at the end of this work. Local peculiarities will be mentioned in their proper places. It is intended here only to give a general description of those great currents and tidal streams, which, although they may be subject to occasional interruption and modification, seem, nevertheless, to depend on constantly existing causes. These currents extend over very large spaces, though varying according to locality and other circumstances; and they are altogether so important a feature in the navigation, that some general knowledge respecting them is indispensable, both to the safety and expedition of vessels in the Gulf and Estuary of the St. Lawrence.

In the main entrance of the Gulf, between Newfoundland and Cape Breton island, a current is very often found setting out to the south-eastward during westerly winds, or in calm weather; but easterly winds retard it, and sometimes cause it to run in the contrary direction. It is frequently deflected to the southward towards Cape Breton island by northerly winds, and by the current from the northward which has entered the Gulf through the Strait of Belle-isle. But winds, both present and at a distance, act so powerfully and irregularly on the rate and direction of the currents and tides in this entrance of the Gulf, as to render it difficult to say anything respecting them that is not subject to exceptions.

Through STRAIT of BELLE-ISLE.—The reality of a current inwards through the Strait of Belle-isle, is confirmed by the presence of icebergs, which it transports into the Gulf every summer, against the prevailing south-west winds; frequently carrying them as far as Mecattina, and sometimes even to the neighbourhood of the east point of Anticosti. It is probable that this is a branch of the great current from Davis Strait, which is known to run along the coast of Labrador, and to transport numerous icebergs far to the southward every year. This current will be mentioned again under the head of the Strait of Belle-isle. Its strength is very much increased by a prevalence of north-east winds, at such times it runs at the rate of 2 knots through the Strait, and for 30 to 40 miles farther to the westward; diminishing gradually in force as it spreads out in the wider parts of the Gulf. Usually, however,

its rate is much less. At times, when south-west winds prevail, it becomes very weak; and it has even been reported that a current has been observed setting out of the Gulf, in a contrary direction to the north-east for days together, but this was never observed by us during either of the three seasons which we passed there. There is, however, no doubt that this current is extremely irregular, as might be expected at the narrow outlet of a great inland sea, where winds, both within and without, must of necessity possess great influence.

After entering the Gulf, the current runs along the north or Labrador coast, at a distance of 2 or 3 miles from the outer islands, leaving a narrow space inshore, in which the streams of the tides, when uninfluenced by winds, are tolerably regular. Passing outside of Mistanoque, the islands of Great Mecattina and the South Makers ledge, it pursues a direction given to it by the trending of the coast, till it is turned gradually to the southward, by the weak current which is often found coming from the westward between Anticosti and the north coast, during westerly winds, and which is set off to the southward from Natashquan point. The united streams continue their southern course at a rate diminishing as they become more widely spread, and which seldom exceeds half a knot; and finally, joining the main downward current out of the St. Lawrence, of which an account will be given immediately, they all pursue a south-east direction towards the main entrance of the Gulf, between Cape Ray and the island of St. Paul. It is this current from the northward which is felt by vessels crossing from off the Bird rocks towards Anticosti, and which, together with neglecting to allow for the local attraction of the compass, has been the principal cause of vessels so often finding themselves unexpectedly on the south coast. Many shipwrecks have arisen from this cause near Cape Rosier, Gaspé, Mal bay, &c.

Both these currents, viz., that from the northward, and the main downward current of the St. Lawrence, are modified by the tides, but in a way directly contrary; for the northern current in through the Strait of Belleisle is accelerated by the flood and checked by the ebb, whilst the other is accelerated by the ebb and checked by the flood tide. These modifying causes, namely, the tides and winds, give rise to various combinations and consequent irregularities in the direction and strength of these streams, which it is extremely difficult at all times to estimate and allow for correctly.

MAIN CURRENT of the RIVER.—The current along the south coast appears to be superficial; at least it was found so in the lower parts of the Estuary, where observations upon the specific gravity of the water on the surface, and taken up from different depths, proved that the water of the St. Lawrence and its numerous tributary streams was widely diffused over the

Estuary.* It has also been observed that the current is strongest in spring, soon after the opening of the navigation, when the rivers are swelled by

* The following are given out of a number of observations, made on board the *Gulnare*, not alone with reference to the nature of the current, but as also showing, that a very moderate degree of agitation of the water is sufficient at times to mingle the warmer surface water with the colder substrata, which always exist at a few fathoms of depth, and thus, by a reduction of temperature of the surface, produce, if the state of the air and dew point be favourable, one of those low fogs, which can often be seen over from the mast-head.

On the 8th July, 1831, the vessel crossed from near Matan, on the south coast, to St. Nicholas harbour on the north, with a light S.W. wind and fine weather, and during the flood tide; when near the middle of the Estuary, the depth was 132 fathoms over a bottom of blue mud. The temperature of the air 64° Fahrenheit

	Specific gravity (examined at 50° Fahr.)
Dew point by Daniel's Hygrometer 58°	
Water at the surface 60° - - - -	1.0180
„ 30 fathoms 35° - - - - -	1.0260
„ 50 fathoms 34° - - - - -	1.0265

A fresh breeze from the westward commenced in the evening, and continued all night, which reduced the temperature of the surface water to 39° by 9 a.m., on the morning of the 9th, when the temperature of the air was 62° with a dense fog, the wind having died away to a light breeze. The fog was seen over from the rigging 40 or 50 feet above the sea. At noon it was calm, and the temperature of the surface had risen to 57°, and the fog in consequence had nearly, but not entirely, disappeared.

On the 9th July, 1831, at noon, the vessel was becalmed 2 or 3 miles to the southward of Point de Monts, and carried to the S.S.E., at the rate of 1½ knots, by the current. It was nearly high water by the shore, and consequently, about an hour and a half before the time when the stream of flood ceases.

		Specific gravity (examined at 50° Fahr.)
The temperature of the air - - - -	62°	
„ Dew point - - - -	61°	
„ water at the surface - -	57°	1.0172
„ „ ¼ a fathom - -	44° } By Six's	
„ „ 5 fathoms - -	40° } Register	
„ „ 10 fathoms - -	38° } Therm.	
„ „ 100 fathoms - -	35° -	1.0275

During the night there was a very strong breeze, which, by the morning of the 10th, had reduced the temperature of the surface water to 37°, and the air to 44°.

On the 19th June, 1832, Point de Monts, N. 61° E. distant 7 miles. Time of tide, half ebb. Wind light, from the westward. Rate of current, 2 knots to the S.S.E.

		Specific gravity (examined at 50° Fahr.)
The temperature of the air - - - -	49°	
„ Dew point - - -	44°	
„ water at the surface - -	44° - -	1·0189
„ „ 10 fathoms - -	37½° - -	1·0232
„ „ 20 fathoms - -	39° - -	1·0246
„ „ 47 fathoms - -	33° - -	1·0262
„ „ 104 fathoms - -	36° - -	1·0275

On this last occasion, the line and attached machine remained perpendicular, from which it was inferred that the whole body of water moved down the Estuary in the ebb tide.

the recently dissolved snows of the winter. But although, generally speaking, there seems no doubt that this current is the tribute of the St. Lawrence on its way to the ocean; yet, in the upper part of the Estuary it is not alone and at all times caused by the discharge of the St. Lawrence, but depends also upon peculiarities in the set of the tides. Thus, when our observations had confirmed the truth of the report that the current always ran down on the south side of the Estuary from a few miles below Red island towards the island of Bic, we could not at first account for the fact, for it appeared impossible that this could be the comparatively fresh water of the St. Lawrence flowing on the surface towards the sea, when we knew that the whole body a few miles above from shore to shore on either side of Hare island, and also in the Saguenay river, was running up during the flood tide. Attention and numerous observations, together with an examination of the temperature and specific gravity of the water, informed us that this was an eddy flood, which is thus explained.

The flood tide ascends in a wide channel more than 100 fathoms deep, when it arrives at the comparatively narrow pass formed by Green island, Red Islet reef, and the extensive shoals off the entrance of the Saguenay river it is obstructed thereby, as well as by the shoalness of the channel to the southward of Hare island. There is not room for so great a volume of water to pass, and part of it is in consequence turned back and forms an eddy flood setting from below Red Islet reef towards the Razade islets, as shown by the arrows in the chart. During the ebb tide, the stream of the Saguenay sets over to the southward in the same direction; hence the current on that side is always down.*

At the time of the preceding observations the line remained perpendicular only as long as the machine was not lowered down beyond 3 fathoms from the surface. At 5 fathoms the line drew strongly out to the N.N.W., and still more strongly when the machine was lowered to greater depths. Hence it appeared, that in the flood tide, only a thin superstratum of comparatively light and warm water moves down, and that the colder and heavier water beneath is either stationary, or moving up the Estuary.

It also appears from the preceding, and many other similar observations, that in fine weather, the comparatively warm and fresh water of the St. Lawrence, and its numerous tributary streams, floats on the surface, but that when the waters are agitated, by any cause, it becomes mingled with the constantly cold water beneath. The temperature of the surface, therefore, depends less upon the warmth than upon the strength of the winds.

* Since the eddy flood above mentioned exercises a considerable influence over the climate near the shore off which it runs (its course being from the Red Islet reef passing near the Razade islets to the island of Bic); and also occasions those dense and low fogs, and peculiar forms of mirage, or terrestrial refraction, which depend upon a temperature of the surface water lower than that of the air, or its dew point, it may not be altogether devoid of interest to give a few additional remarks concerning it.

Of the fact of its being really the stream of flood, although running down the Estuary, there was ample opportunity of ascertaining; especially during the nine or ten days the vessel was employed in sounding within the limits above mentioned; and during which

There is no upward stream of the tide (excepting so close in-shore as to be useless to ships) all along the south coast from Cape Gaspé to a few

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many observations were made with the object of ascertaining the set, strength, and course of this peculiar stream. The remarks made on the 19th July 1831, are selected as being alone nearly sufficient to establish the fact of this part of the general downward stream, or current, being the flood tide. The *Gulnare* was then at anchor, in 10 fathoms, about 1 mile N.E. of the eastern Razade islet. In the last quarter ebb the stream ceased, being prevented from coming to us by the shoals, which are dry at low water, between Green and Basque islands and the main, but it still continued to run strongly down a short distance outside of our anchorage.

There was no stream at the vessel until it was past a quarter flood by the shore, when the downward stream commenced and continued during the remainder of the flood *at a greater rate* than during the preceding or following ebbs. Soon after high water by the shore the downward stream again ceased for a short time, after which the first of the ebb came off the shoals and then turned down the estuary as before. Now it appears that the eddy flood did not reach us till the end of the first quarter flood by the shore, because time was necessary for the tide to ascend the deep and unobstructed channel to the northward, and to rise and accumulate at the obstructed part of the channel above us, before it was compelled in part to retrograde, and descend to us through a distance of 16 or 17 miles. It ceased again soon after high water, because the stream of flood had ceased above, there being only a few minutes' difference in the times of high water at the two places.

A ship becalmed below the Red Islet reef was brought down to the *Gulnare* by the eddy flood, and drifted past about half a mile outside of her. And, on another occasion, during the flood tide, when she sailed from near Red Islet to off Bicquette, passing within 2 or 3 miles of the Razades, she was carried a-head of her reckoning at the average rate of 2⅝ miles per hour. When beating against a westerly wind, on many occasions, between the island of Bic and the Razades, she never could gain ground to windward, excepting during the last quarter of the ebb and the first of the flood tide.

The specific gravity of the water of this stream during flood tide was found to be nearly as great as the surface water of the Gulf, and higher than that of the Estuary lower down; and it was also, like the latter, when taken from considerable depths, or when violently agitated by strong winds, extremely cold. Its temperature was usually between 38° and 45°, and was never found higher than 49°, Fahrenheit. It was seen as low as 39° in every month from June to September inclusive, and that at times and under circumstances when the surface water of the Estuary in other parts was usually about 60°, and when the fresh water of the St. Lawrence above was at an equally high temperature. The great specific gravity and low temperature of this stream are incompatible with the popular supposition of its being, in this part, the lighter and fresher water of the St. Lawrence flowing on the surface towards the sea.

To the same cause which gives rise to the retrograde course of this stream of flood must also be attributed its superior specific gravity and low temperature. For as the great body of the flood tide, moving in the deep North channel, meets with resistance at the shoals of the Saguenay and Red islet, the cold water of the Estuary, which everywhere exists at a very moderate depth, is forced to the surface, and thus, together with the irregular bottom, gives rise to the violent whirls and ripples which abound in that vicinity. The thin superstratum of warmer water is thus mingled with, and lost, in the superior quantity of colder water from beneath, and a great reduction of temperature effected.

May not the low temperature often found over shoals in the sea be attributed to a similar cause, and especially the lower temperature of the water on the Bank of Newfoundland, as

miles below Red Islet, in consequence of the union of this eddy flood with the main current of the river; and they have, therefore, so much influence on the navigation that it will be useful to trace their course more particularly.

Commencing from a short distance below the Red Islet reef, the current is there very strong—about 4 knots. It decreases in velocity as it proceeds to the south-eastward, slanting over towards the Razade islets; off which its rate is from 2 to 3 knots. It runs strongly along the northern edge of the Bank of Soundings off the south coast, upon which, especially in spring tides, a weak stream of flood will be found flowing in the opposite direction, and the boundary of the two streams is usually marked by a strong ripple. From Father point to Cape Chatte, the rate of the downward current varies from a half to 2 knots, according to the tide, direction of the winds, and season of year.

During the ebb tide the stream runs down on both sides, stronger on the south than the north coast, and weakest in the middle of the Estuary. It is deflected, or turned off to the southward, by the Points Mille-Vaches, Bersimis, Manicouagan, and Point de Monts, and by the ebbing streams of the large rivers between them, a circumstance which should be carefully attended to by vessels coming up with a northerly wind; as they will infallibly be set over to the southward upon a lee shore, if they do not make the necessary allowance by keeping their wind well over to the northward.

During the flood tide this stream still continues to run down outside the Bank of Soundings off the south coast, although with diminished velocity, and is felt about half way over towards the north shore. In the middle of the Estuary there is usually slack water; whilst along the north coast the stream of flood is regular in its recurrence, increasing in force as we ascend the Estuary. The strength of the stream of flood is greatest in-shore, and diminishes as we proceed over to the southward, till at the distance of about 3 leagues it becomes insensible. These differences in the strength and direction of the streams produce strong ripples in various parts of the Estuary, but their position varies with the different times of tide, and perhaps from other causes, so that they cannot safely be trusted for any guidance to the seaman.

Round Point de Monts there is little or no stream of flood, excepting very close in-shore; the downward current is constant, or nearly so, off that point; and it requires a fast-sailing vessel to beat round it against a

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compared with the neighbouring sea? for the great current, which brings the icebergs down along the coast of Labrador from the northward, must meet with obstruction in its course to the southward from these banks, and the cold water, in consequence, be forced to the surface; and, if this be so, we may probably find a reason for the prevalence of fogs upon these Banks.

westerly wind. Point de Monts turns this current over to the S.S.E., at a rate varying from 1 to 2 knots; so that a vessel, having a west wind, and standing over to the southward on the starboard tack, will be carried towards the south coast at a rapid rate, having the current on her weather quarter; during her board back to the northward, she will be retarded, the current being then directly opposed to her course. When sailing at the rate of 4 knots, it will usually require only about half the time to go from near Point de Monts over to the south coast, that it will take to return from the latter to the former. This is a most important circumstance, which it is necessary to carefully guard against, when beating up the Estuary in this part during dark nights, and, especially, in foggy weather.

Below Point de Monts the current is no longer felt near the north coast, nor, indeed, anywhere to the northward of a line joining Point de Monts and Anticosti. It is confined to the neighbourhood of the south coast, which it follows in its curve to the southward, running strongly past Cape Gaspé, Flat island, and Bonaventure island; whence, curving gradually to the south and south-east, it continues its course towards the entrance of the Gulf, with a rate very much lessened in consequence of the great space over which it is now spread. The usual breadth of this stream from Magdalen river to Cape Gaspé is 9 or 12 miles; but this, we believe, is not uniform.

When south-west winds prevail, it appears that this current, or a branch of it, is driven over from the vicinity of Magdalen river towards Anticosti; part of the stream running round the west point of that island sets across nearly towards Large island, (one of the Mingan islands,) whence turning gradually down outside the Mingan and Esquimaux islands, and along the north coast, it sweeps round the curve to the westward of Natashquan point, and is turned off to the southward, as has been already mentioned in page 23. The other part sweeps round the large curve, or bay, between the west and south-west points of Anticosti, and is turned off to the southward by the latter point, frequently causing a great ripple off it, which has been mistaken for breakers on a much more extensive reef than exists there. The rate of this current has been noted, off different parts of the south coast between Capes Chatte and Gaspé, in the months of June, July, August, and September, and in different years, and scarcely ever found the same. It varied between 1 and 2 knots in westerly winds. It was weaker, often nearly insensible, in easterly winds; and in one instance, off Mont Louis river, in a calm which was followed by a strong breeze from the eastward, it could not be perceived.

Vessels beating up the St. Lawrence against westerly winds usually experience little difficulty in making good way to windward, after having weathered the west point of Anticosti and arrived on the north coast;

because there is seldom any current on that side, and the tides, although weak, are tolerably regular. It is in general easy to beat from the Seven islands to Point de Monts; for there the stream of flood is stronger than the ebb; the latter, as well as the current, being turned off to the southward by the point. There seems, at times, also to be an eddy current there, sweeping round the great bay or curve between the above-named points. It sets off from about Egg islet to the S.S.W.; and is the probable cause why vessels, which shape a direct course for Point de Monts with a leading north-west wind off the land at night, so often find themselves obliged to haul up for, or unable to fetch, the light.

Any farther remarks respecting the tides and currents will be of a more local nature, and will, therefore, be best given where the particular places or parts of the coast are described. The object here was to give a condensed view of the principal streams which mainly affect a vessel in her voyage either up or down through the Gulf and Estuary; and in the following Chapter will be found their usual effects, and the allowances which should be consequently made.

CHAPTER III.

GENERAL DIRECTIONS FOR NAVIGATING THE GULF AND RIVER OF ST. LAWRENCE.

VARIATION, 26¼° to 18½° WEST in 1860.

DIRECTIONS ACROSS THE GULF.—Vessels bound to Canada, or to any of the ports in the Gulf of St. Lawrence, should endeavour to make St. Paul island (*see* page 51) which, being of considerable elevation, and bold all round, may, with care and a good look out, be made at night, or even in fogs, unless the former be very dark, or the latter very thick.*

The island of St. Paul, which lies in the main entrance to the Gulf, between Cape Ray, at the south-west extremity of Newfoundland, and Cape North, near the northern extremity of Cape Breton island, has two lighthouses erected on it, which have been of the utmost assistance to mariners. The northern one stands on a detached rock within 26 feet of the north point, and exhibits a *fixed white* light; the other lighthouse is placed on the extreme south-west point, and exhibits a *revolving white* light (page 52). From the south point of the island, Cape North bears W. by S. ½ S., distant 13 miles; and from the north point Cape Ray bears E. ¾ N., distant 41½ miles.

CAUTION.—In approaching St. Paul from the south-east with northerly winds, the current, mentioned at page 22, as at times coming from the northward, and setting towards the shore of Cape Breton, should be guarded against by attending to the soundings on the banks, which extend 7 or 8 leagues off Scatari island, and off the eastern coast of Cape Breton island as far northward as Inganish; beyond which the depth is too great to afford any guidance. In clear nights the *revolving* light on the north-east point of Scatari island can be seen 15 miles off: the lighthouse is an octagon white building 70 feet high. There is also a lighthouse recently erected on Flint island, which, most injudiciously, shows a *flashing* light, so little distinguished from the *revolving* light on Scatari island, (from which it bears N. ½ E. 10 miles,) that they have already

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* *See* Chart:—Gulf of St. Lawrence, No. 2,516; scale, $d = 3{\cdot}7$ inches.

been mistaken for each other. There is also a *fixed* light at the entrance of Sydney harbour. These lights, (for which, *see* Chap. XXII., Vol. 2,) together with the soundings, afford abundant guidance to vessels passing the eastern extremity of Cape Breton island. The south coast of Newfoundland, eastward of Cape Ray, is broken, rocky, and dangerous. The tides and currents, being influenced by the winds, are irregular; whilst all southerly and easterly winds, and often also south-westerly winds, bring a thick fog, which is most dense near the lee shore. On these accounts this coast should not be approached, excepting with a decided northerly wind and clear weather.

ST. PAUL to the BIRD ROCKS and MAGDALEN ISLANDS.—After having made St. Paul, vessels bound to Canada should endeavour, if the weather be clear, to make the Bird rocks, the largest or south-eastern-most of which bears from the north point of St. Paul N.N.W. 55 miles.

There is a deep channel between St. Paul and the bank on which the Magdalen islands, Bryon island, and the Bird rocks are situated. This channel is 12 miles wide, and no soundings have been found in it with 60 fathoms of line. Twelve miles N.W. from St. Paul, on the south-east extremity of the above bank there are 50 fathoms water over a bottom of fine sand; and 13½ miles from the island, on the same line of bearing, there are 35 fathoms, the bottom being the same, with the occasional addition of gravel. From this point the water shoals gradually towards the Magdalen, distant 42 miles.

Following the eastern edge of the bank to the northward, inclining gradually to the north-west, regular soundings extend from 28 to 35 fathoms over sand, stones, and broken shells; the latter depth being where the Great Bird rock bears W.N.W.; and when the same rock bears W. by S. ½ S., distant 13½ miles, there will be 50 fathoms over fine sand on the edge of the bank, off which there is no bottom with 70 fathoms of line. At the distance of 10 miles from the rock, and on the same line of bearing, there are 43 fathoms; and at 6 miles 33 fathoms, shoaling gradually in to 24 fathoms, within a mile of the rocks. This bank is an excellent guide up to the Bird rocks at night, or in thick weather, which almost always accompanies easterly and southerly winds: but under such circumstances it will be safer to run along the northern edge of the bank, taking care not to come into less than 40 fathoms, than to attempt to make the Bird rocks. When well past them by the reckoning, a course can be shaped up the Gulf.

In northerly winds the weather is usually clear; and, if the ship be far enough to windward, it will be advisable to stand to the westward and endeavour to make Entry island (page 63), taking care to avoid the Doyle

reef and the Sandy spit off the east end of the Magdalen islands, by not approaching the islands in that part nearer than the depth of 20 fathoms. Under the lee of these islands a smooth sea will be found, sufficient guidance by the soundings, and good shelter and excellent anchorage in Pleasant bay.*

Another advantage of following this course arises from the circumstance that the winds generally veer to the south-west; so that, if a vessel has passed to leeward of the Magdalen islands with the northerly or north-west winds on the starboard tack, the succeeding south-west wind will enable her to stand on the opposite tack towards Cape Gaspé.

From the north point of the island of St. Paul to the east point of the Magdalen islands the course is N.W., distance 56 miles; and to Entry island N.W. by W. ½ W., 63 miles.

BIRD ROCKS TO ANTICOSTI ISLAND.—From the north Bird rock the lighthouse on the south-west point of Anticosti island bears N. by W. ¾ W., 134 miles; and the East cape of Anticosti, N. by E., 80 miles.

After leaving the Bank of Soundings, northward of the Bird rocks, the water is deep all the way until near the shores of Anticosti, there being no bottom with 80 fathoms of line, nor probably at much greater depths. In making this part of the voyage up the Gulf, the frequent current from the northward, mentioned in page 23, as having been one of the causes of shipwrecks in the neighbourhood of Capes Rozier and Gaspé, Mal bay, &c., should be considered. Accidents, however, from this cause can never occur if the lead be used; for, upon consulting the chart, it will be seen that there are soundings to be obtained nearly all the way upon, and to southward of, a line joining the Bird rocks and Cape Gaspé, whilst a few miles to the northward of that line there is no bottom with 80 fathoms of line. The lighthouse erected on Cape Rozier will also be of great assistance. It is a circular white tower 112 feet high, and shows a *fixed* light visible in clear weather from a distance of 16 miles.

With a fair wind the object should be to make the lighthouse or *revolving* light upon the south-west point of Anticosti; and, with westerly winds, any part of the coast of that island which can be attained. The *fixed* light on Heath point, at the east end of that island, will render it easy to make the east end of the island at night, if the weather be clear; and, if the weather be thick, the Bank of Soundings, which extends off it 28 miles to the south-eastward, may

* *See* Chap. IV. for a description of these islands.

serve to determine the vessel's position by the lead. At the distance from the island above named the depth is 62 fathoms, shoaling gr ally in towards the island.*

PASSAGE NORTH of ANTICOSTI.—In the event of a vessel being near the eastern extremity of Anticosti, and having succeeded in making East cape, or the light on Heath point, with a south-west wind, it will often be preferable to proceed to the northward of the island, where there is a good channel, rather than to tack and stand back to the southward and eastward. Under the lee of Anticosti, she will in this case have a smooth sea, and often also clear weather, whilst there is a heavy swell and frequently a thick fog to windward of it. She will, moreover, avoid the current out of the St. Lawrence, which runs constantly with westerly winds between the south coast and Anticosti; and thus be able at all times to make way to the westward in moderate weather. At night, or in foggy weather, the Bank of Soundings off the north coast, and farther westward the banks off the Mingan islands, will safely guide her, even although the land should not be visible.

All the way from Natashquan point to the river St. John, westward of the Mingan islands, there are banks of sand, gravel, broken shells, and bits of coral, extending off the coast many miles. Off the Mingan islands these banks extend halfway across to Anticosti. The depth of water upon them is very various: to the eastward, or below the Mingan islands, it is in general between 30 and 50 fathoms; but in some few places it exceeds the latter depth, whilst in others there is as little as 19 fathoms. Abreast the islands there is still less water occasionally; but to the southward of these banks, and between them and Anticosti, there is a deep channel; in which, from opposite the east point to abreast the west cliff, the soundings exceed 100 fathoms. Proceeding westward the depths gradually decrease to 60 fathoms off the north point, where they become irregular for a few miles, varying from 50 to 70 fathoms with occasional rocky bottom; and then deepen again, with mud bottom, further to the westward.

In all this deep water channel, with the single exception which has been stated, the bottom is, for the most part, of blue mud. Such a remarkable difference in the nature of the bottom, as well as in the depth of water, renders it comparatively easy to take a ship through this channel at night, or in foggy weather. But in order to effect this with safety the vessel should be furnished with Massey's patent sounding machine and

* For the lights on Anticosti, *see* page 70.

lead, or other similar instrument, which must be freely used as she runs along the southern edge of the banks of sand, gravel, and shells, sheering occasionally to the southward into the deep water and muddy bottom, to make sure of not getting too far to the northward.

The dangers of this channel may be said to commence with the reefs off St. Genevieve and Hunting islands, on approaching which from the eastward, the chart should be carefully consulted, for they are very dangerous, and there are some deep water soundings, between 50 and 70 fathoms inside the outer banks, which might lead to a mistake if care were not taken to keep on the southern edge of the outer banks.*

These deep water soundings commence off the high peninsula Watcheesho, and extend, irregularly, being deep holes in the banks, to within a short distance of the Bowen rocks off St. Genevieve island. But the vessel, if properly conducted, will be at least 9 miles to the southward of the rocks off St. Genevieve; and as there are soundings in a moderate depth of water, 5 or 6 miles from Collins shoal, the outer danger off Hunting island, and the channel, excluding the reefs, is there 23 miles wide, there seems no difficulty in this part which may not with common prudence be avoided. Proceeding westward, the channel contracts gradually to the narrowest part, which is between the reefs off the North point of Anticosti and off Mingan island, where it is 13½ miles wide. To pass this safely, at night or in foggy weather, it is necessary that the lead should be kept constantly going as the vessel runs along the southern edge of the bank off the Mingan islands, and she should not be allowed to go to the northward into less than 30 fathoms of water.

If the vessel should be met by a westerly wind, down the channel, it will be attended with clear weather, and the white cliffs of Anticosti, which extend from the east point westward to opposite St. Genevieve, will easily be seen. A vessel may stand in without fear to within a mile or two of this part of the coast, which, with the exception of the reefs off Fox bay, is bold and free from danger. Farther westward the coast is low and shelving, and reefs extend further off. In the board to the northward at night, the sounding on the banks will show when to tack.

CURRENTS.—It has been remarked already (page 28) that, in westerly winds, there is a weak current down this channel, but it is not constant, and its rate seldom exceeds half a knot. Sometimes it is imperceptible during the flood tide, and runs even the other way on the approach

* *See* Charts:—Mingan Islands, Nos. 1,132, 1,133; scales, $m = 0{\cdot}8$ of an inch; and Sheets 3 and 4, Gulf of St. Lawrence, Nos. 305, 306; scales, $m = 0{\cdot}25$ of an inch.

of easterly winds. Vessels, however, should be aware, that on arriving off the North point of Anticosti with a west or south-west wind, this current will almost always be found setting over to the north-east, being turned off into that direction by the west end of the island. Confined within a comparatively narrow channel, it is here stronger than elsewhere, running, in the ebb tide, about a knot, and in the flood tide, half a knot in the offing.*

PASSAGE SOUTH of ANTICOSTI.—Vessels meeting with a westerly wind in the south channel should stand over towards the island of Anticosti, and make boards, off and on, of 9 or 12 miles, to avoid the current out of the St. Lawrence. In beating between Cormorant point and South point, off which there is a dangerous reef, keep the lighthouse on Heath point open of Cormorant point. In standing in-shore at night to the eastward of the South-west point, do not bring the *revolving* light on this point to bear to the westward of N.N.W., or when standing in-shore to the westward of it, to the southward of S.S.E. $\frac{1}{2}$ E. Farther particulars respecting the navigation along the shores of Anticosti will be found in the next Chapter.

CAUTION.—In moderate weather a vessel will generally gain ground to windward all along the south coast of Anticosti, but care should be taken to avoid being becalmed, near the shore, between the South-west and West points, where both the swell and current set inshore, and where, the bottom being of clean flat limestone, an anchor will not hold. It is by no means uncommon off this part of the coast, for the fine weather W.N.W. breeze of summer to die away suddenly to a calm, so that a vessel beating here should stand off shore on the first appearance of a decrease of wind. In the month of August of two following years, we were nearly driven on shore, under St. Mary cliffs, by a sudden calm. The sea was at first quite smooth, but a heavy swell from the south-westward soon commenced, and continued for 3 or 4 hours before the breeze which caused it made its appearance.

From the revolving light on the South-west point of Anticosti to Cape Henry (Ellis bay) the bearing is N.N.W. $\frac{1}{4}$ W. and the distance 39 miles; and 8 miles farther, nearly in the same direction, will bring the vessel to the fixed light on the West point of the island, which can be seen from the distance of 15 miles.

Having made the South-west point, and being 4 or 5 miles off it, with a fair wind, a course should be steered along the coast, so as to pass 8 or 10 miles to the southward and westward of Cape Henry and West point.

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* Remarks on the tides in-shore, and on the dangers in this channel, will be found in Chapters IV. and VIII.

N.W. ½ N. will be a safe course at night or in thick weather, when the lead should be hove every half-hour. With this precaution there is no danger of being set too near the coast, even when the lights cannot be seen, since there are soundings in less than 40 fathoms, at a distance varying from 5 to 3 miles off shore all the way from the South-west point to the west end of the island.

ANTICOSTI to POINT de MONTS.—From the West point of Anticosti, the south extremity of Point de Monts bears W. ¾ N. distant 116 miles. An inspection of the chart will show that there are soundings in various depths, between 50 and 100 fathoms, from the western end of Anticosti to nearly opposite the Seven islands, whilst to the southward there is no bottom at a much greater depth. These may be of use in discovering the situation of a vessel when light winds and fogs prevail for several days in succession, and the land in consequence has not been seen.

When the vessel has arrived off the West point of Anticosti, with a fair wind still continuing, a course should be steered well to the northward, especially with northerly winds, say for about Egg island. She will thus avoid the strength of the current, and the possibility of being set over too near the south shore by its acting on her starboard-bow. When she has run about half way across she should haul more to the southward, so as to insure clearing Point de Monts.

CAUTION.—If the weather be clear, there will be no difficulty in making the lighthouse on Point de Monts,* and its *fixed white* light at night can be seen, under favourable circumstances, 7 or 8 leagues from the fore-yard of a ship. But if the weather be thick, as it commonly is, with a fair wind for running up, great caution is necessary. In such circumstances, after having run within about 15 miles of Point de Monts by the reckoning, sail should be reduced, so as to have the vessel under complete command, and she should be rounded to, and a good deep cast with Massey's patent lead obtained, so as to insure that she is not to the north-eastward of the point, and this should be repeated every half-hour, until the light be seen, or it is certain that it is past.

If the vessel be to the north-eastward of Trinity bay, soundings will be obtained in less than 60 fathoms, from 4 to 6 miles off shore. Directly off Trinity bay, there is the same depth 3 miles off shore; whilst, at the same

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* Point de Monts received its name from the Sieur de Monts, a celebrated French commander, who was there in the beginning of the 17th Century. Point *des* Monts is an inaccuracy, and Bald Mountain point is absurd, as there is no mountain near the point.

Cape *Chat* should be Cape de Chatte, so called from the commander who preceded the Sieur de Monts; and the Cape Misho of the old charts should be Cape Michaux.

distance off Point de Monts, there is no bottom at 100 fathoms. If the distance to Point de Monts has been run by the reckoning without finding bottom at 70 fathoms, it will be almost certain that the vessel is not to the northward; but still, as the effects of currents cannot be exactly calculated, and reckonings are liable to error, it will be prudent to shape a course well to the southward of the point, till there remains no doubt of its having been passed.

In making the light on Point de Monts, remember that it is not on the extremity of the point, but has been placed (it is thought very improperly) 1¼ miles to the north-eastward, along the coast towards Trinity bay.*

Point de Monts may be approached to three-quarters of a mile with safety, but not nearer in a large ship, since there is a ledge of rocks, with only 9 feet at low water, nearly half a mile south-eastward of the extremity of the point, and south-westward of the lighthouse. There are also one or two patches of rock, with 12 feet of water, to the southward and south-eastward of the lighthouse, but these are not more than a third of a mile off shore at low water.

The foregoing remarks apply where the object is to make the lighthouse, or light, on Point de Monts, which should always be attempted where there is any chance of success, because it is extremely desirable to obtain a fresh departure before running up the comparatively narrow Estuary. But if the weather be so thick, as to leave no reasonable hope of succeeding, or if the wind be from the southward, a course should be steered more to the southward, so as to pass well clear of the point.

WITH BEATING WINDS.—Vessels beating up against westerly winds should stand over to the northward, as soon as they can weather Anticosti, unless the barometer, or other indications, render it probable that the wind will veer to the southward. During the flood tides, make short boards off and on the north coast, to take advantage of it, for it runs strongest in-shore. During the ebb, keep farther off the land, for that tide also runs strongest near the shore. The tides, in general, are weak along this coast, and a vessel will always make way to windward in moderate weather.

From the Seven islands to Point de Monts is, in general, the easiest part of the passage, for the W.N.W. wind, which, in this part, is the most common westerly wind, is off the land, so that a vessel can frequently fetch up to Point de Monts in smooth water, particularly at night, when the wind in fine weather generally veers a point or two to the northward. She will also have the benefit of the flood tide, whilst the ebb, being turned off by Point de Monts, is scarcely felt.

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* *See* page 226.

If it blow fresh, and the flood be nearly done on arriving near Point de Monts, there will be no use attempting to beat round it till next tide, and then only in fine weather. In this case, Trinity bay, where with westerly winds a pilot will generally be found, is a good anchorage with moderate depth of water, good ground, and plenty of room to get under weigh.

POINT de MONTS to BICQUETTE ISLAND.—From the south extremity of Point de Monts, the lighthouse on the north side of Bicquette island bears W.S.W. 79½ miles; and the south point of the Manicouagon shoals W. ¼ S. 33 miles; but as this great shoal extends towards English bay, its north-east end is only 28 miles distant from Point de Monts.*

CAUTION.—Having now arrived at the comparatively narrow Estuary, where the tides and currents are much stronger, and more various in their direction, than in the wider parts previously treated of, and where there are shoals extending on the north side several miles off the shore, a good look out and constant attention to the soundings, become indispensably necessary at night, or during the fogs, which are so prevalent and embarrassing in this navigation.

CURRENTS.—After taking a departure from Point de Monts, the course to be steered must vary under different circumstance of wind and tide. The downward current is not only turned off to the southward by Point de Monts, but the Manicouagon and Bersimis points also produce the same effect, although in a less degree, during the ebb tide; to which must be added the streams out of the large rivers Manicouagon, Outard, and Bersimis. During the flood tide, the streams out of these rivers cease, the general current is checked in the offing, whilst in-shore, within a few miles of the north coast, a stream of flood will be found (page 23).

A vessel taking her departure from Point de Monts with a whole ebb tide before her, is therefore very differently circumstanced from one which does the same at the commencement of the flood, and must reckon upon being set over towards the south coast much faster in the former than in the latter case.

Directions will first be given for a fair wind, and afterwards for beating winds.

DIRECTIONS up the ESTUARY.—Having made the light on Point de Monts, and being 3 or 4 miles off it to the southward, with the usual easterly winds, nearly or right up the Estuary, steer W. by S. until up nearly as high as the Minicouagon shoals, then keep half a point more

* *See* Charts :—River St. Lawrence, Part I., No. 309; scale, $m = 0{\cdot}25$ of an inch; and Sheets 1 and 2, below Quebec, Nos. 311, 312; scales, $m = 0{\cdot}5$ of an inch.

to the southward, W. by S. ½ S. These are safe courses with either ebb or flood, and if the vessel has left Point de Monts or at or near the commencement of the ebb tide, will usually bring her into soundings off Metis, where 30 fathoms over sandy bottom will be found 3 miles off shore, and 50 fathoms 5 miles off shore, and on the edge of the bank.

If, on the contrary, the vessel has left Point de Monts early on the flood, she will probably be farther to the northward; we say, probably, because the strength of the current is too uncertain to allow of saying that she positively will be so. However, the degree of uncertainty, which the irregular rate of current gives rise to, must be met by the use of the lead. If, therefore, the weather be thick, and the land not seen, round-to in time, particularly if the vessel has had the ebb tide against her, and get a cast of the lead, to make sure that she has not been set too near the south coast.

If no bottom be found at 60 fathoms, the W. by S. ½ S. course may be continued until the vessel is up as high as Metis by the reckoning, then let soundings again be tried for, and if still without finding bottom haul in gradually to the southward, under easy sail, and with the deep-sea lead going, so as to endeavour to strike soundings on the bank off Father point, which may be accomplished safely, since the bank in that part extends several miles off shore. When Father point bears South distant 5 miles, the depth is 30 fathoms, over a bottom of soft clay, and with Barnaby island on the same bearing, distant 7 miles, the same soundings will be found.

To pass Bicquette Island.—The *revolving* light on Bicquette island (*see* page 99), will now be distant about 15 miles to the W.S.W., and visible in clear weather; but if it be foggy, and the light not seen, proceed as follows; attending to the gun which is fired from the lighthouse *every hour*:—Run along the northern edge of the bank of soundings, with the lead going, taking particular care not to go to the southward into less than 30 fathoms. When it is judged that the vessel is approaching near Bicquette, having passed Barnaby island, haul out a little to the northward until she is out of soundings, and then steer W. by S. ¼ S., still heaving the lead, and having the vessel under moderate sail for the purpose of getting bottom, till certain that she is well above the North-west reef of Bicquette. If soundings are struck at all, whilst running past this dangerous island, on which many vessels have been wrecked, the vessel must be hauled off immediately to the northward out of soundings, and then steer as before.

When it is quite certain the vessel is past Bicquette and its reefs, haul in to the southward by degrees, till the edge of the bank is gained again, and keep it up to Green Island reef (page 106).

Bicquette and its dangerous North-west reef lie near the northern edge of the bank of soundings, and were difficult to pass safely at night or in fogs, without a chart containing correct soundings or the aid of a light; but now that those wants are supplied, it may be safely accomplished, with the assistance of Massey's patent sounding machine, by any seaman of common prudence and intelligence. Two miles North of Bicquette there are 30 fathoms: and only $1\frac{1}{4}$ miles North of the North-west reef there is the same depth, with sandy bottom. Farther off no bottom will be found at 50 or 60 fathoms. Both the island and reef are bold to the northward, having 12 fathoms close to them.

It would not be prudent for vessels, without a pilot, to attempt running inside of Bic island in foggy weather, unless well acquainted. If, however, it be necessary to do so, for the purpose of anchoring, see directions for that island, page 98 to 103.

CAUTION.—It must be remembered, that the courses which have been recommended are independent of the *deviation* or local attraction; and that its effect, although varying in amount in different vessels, is in wood built ships, and some iron ones, to make it appear that they are steering less to the southward than they are in reality, if the compass be, as usual, in the after part of the ship, and if there be no large masses of iron, as an iron tiller for instance, still farther aft: for, in this latter case, the attraction of all the rest of the iron in the vessel may be neutralized or overcome by that of the iron abaft and close to the compass.

To render the effect of deviation apparent, we will suppose it to amount, in a wood built ship,—when the north end of the needle is attracted to the bow,—to a point of the compass, no uncommon occurrence on a 6 or 8 point course,* and the vessel to be steering W. by S. $\frac{1}{2}$ S. by the compass in her binnacle. She will then in reality be making a S.W. by W. $\frac{1}{2}$ W. course, which would soon put her on shore on the south coast, an event that would be accelerated by the current, which, instead of stemming, she would have on her starboard bow checking her in-shore.

A case exactly similar to the one just supposed, occurred on the night of the 8th September, 1831, when the ship *Jane*, of Belfast, having several large chain cables, and other extra iron on board, by which the deviation must have been greatly increased, ran stem on to Bicquette, with a fair wind, but thick fog. She was steering the regular course up the middle of the Estuary; but her master was quite unaware of the effect of the great mass of iron in her hold upon her compasses, and equally so, that previous to the accident which caused the total loss of his vessel, he had been running for many miles in less than 20 fathoms water, the Bank of Soundings not being laid down in his chart.

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* *See* also page 14.

These remarks, and others which have been made respecting the deviation, will show how important a knowledge of it is to the safety of a vessel, and will, moreover, point it out as the duty of every commander, to endeavour to ascertain its amount during the voyage, and before he arrives in a difficult navigation like the St. Lawrence, where the fogs may frequently oblige him to run as high as Green island without having been able to obtain a pilot.

PILOTS.—Pilot schooners are often to be met with off Point de Monts, and pilot boats frequently wait off Caribou point, at Trinity bay, near the lighthouse on Point de Monts, and in St. Augustin cove. If, however, a pilot should not have been obtained, and it be in the daytime, a vessel may safely stand in under easy sail and with the lead going, and endeavour to make the houses on Father point, although the weather be thick; running along the land from the eastward for that purpose, and going no nearer than 11 or 10 fathoms at low water. Many pilots live on this point, and there is almost always one to be obtained.

Even in a foggy night a tolerably correct opinion may be formed whether the vessel be up to Father point, or not; for an inspection of the chart will show, that the soundings shoal more gradually to the southward there than they do farther to the eastward. If the vessel be hove to, in 10 or 11 fathoms, low water, with her head off shore, a gun or two will be almost sure to bring off a pilot, unless the weather be very bad, for the pilots are fearless and excellent boatmen.

From POINT DE MONTS with SOUTHERLY WINDS.—We have hitherto been speaking of the case when vessels are running up with easterly winds and thick weather; but a second case is when the wind is from the southward; then the direct course, W. by S. $\frac{1}{4}$ S., may be steered, if the vessel be, as before, close off Point de Monts, or W. $\frac{3}{4}$ S. if she be nearer the south coast: allowing still for the set of the current to the southward, according to the tide, and sounding in time if the land be not in sight. Whenever the weather is foggy, and the land cannot be seen, the object should always be to strike the Bank of Soundings along the south coast about Metis, or Father point at farthest, and then follow it as a guide to the westward.

With NORTHERLY WINDS.—A third case, of frequent occurrence in the autumn, is when there is a fresh northerly wind. The weather is then invariably clear, and, as the land can be seen, there is no danger of getting on shore with a good look out; but the strength of the current to the southward is increased by this wind, and therefore the vessel must be kept well to the northward, to prevent being set over to the lee-shore, and

being, in consequence, obliged to tack (upon the wind veering a point or two to the westward) and stand all the way back again.

Supposing the vessel to be in the same position as before, 3 or 4 miles to the southward of Point de Monts, she may fearlessly steer West for the first 20 miles, or as long as the light is seen. Take the bearing of the light every half hour, and lay it down on the chart, in order that the effect of the current may be seen; and if it be found that it sets the vessel very fast to the southward, as it probably will, particularly during the ebb tide, haul up still higher, but take care not to bring the light to bear to the eastward of E. by N., lest she gets too near the Manicouagon shoals. When it is reckoned that the vessel is up to these shoals luff up in the wind, and get a deep cast of the lead, for although these shoals are steep-to on their east side, and also to the westward of Manicouagon point, yet there are soundings off their south point. When Manicouagan point bears North the depths will be from 50 to 60 fathoms, at the distance of $5\frac{1}{2}$ miles off shore, and from 30 to 40 fathoms at 4 miles off shore, the bottom being of very fine sand. In the first case, she will be $3\frac{1}{4}$ miles off the south point of the shoals, and in the latter case, only $1\frac{1}{2}$ miles.

When past these dangerous and extensive shoals, the south point of which extends $2\frac{1}{2}$ miles off a low point of the same name, which can seldom be clearly distinguished at night in consequence of the higher land behind it, a vessel may haul well up under the north shore, coming no nearer than 3 miles, and taking care to avoid the shoal off Bersimis point, which extends nearly $1\frac{1}{2}$ miles off a low point, also difficult to be seen at night.

There is also a rocky shoal, first discovered during this survey, and named the Gulnare shoal, which lies nearly 2 miles off Cape Colombier. And, lastly, give a good berth to the low point of Mille-Vaches, off which the shoals extend 2 miles, as will be seen by the chart. All these shoals are extremely steep, and there is, in consequence, no trusting to the lead in approaching them with a vessel going fast. For description of these shoals *see* Chap. IX.

After passing Mille-Vaches point the north coast is bold and without anchorage all the way to within 3 miles of the Saguenay river.

EFFECTS of the CURRENT and TIDES.—Although it has been stated that the strength of the current down the Estuary of the St. Lawrence is uncertain, yet it may be useful to give an idea of its rate and effect as experienced on two occasions in the surveying vessel *Gulnare*.

First, when running up from close off Point de Monts, which was left at the commencement of ebb tide, with a strong breeze from the northward, it was found that the vessel was retarded by a stream of 2 knots per hour, and that the set to the southward, at right angles to the course, was at the

same time 11 miles in 7 hours, the wind being free, and the rate of sailing 8 knots. This occurred in the month of October.

The second refers to an effect of the tidal stream, which is more local and higher up the Estuary, but of which it is most important to the safety of a vessel to be aware.

The *Gulnare* had been becalmed 5 or 6 miles south of Bersimis point, when a breeze sprang up from the eastward at 10 h. 30 m, p.m. Although a W.S.W. and S.W. by W. $\frac{1}{2}$ W. course was steered, yet at 4 a.m. Bicquette was sighted bearing South 2 or 3 miles, and she was obliged to haul up to clear the North-west reef. Had this occurred in a vessel where the lead was neglected, and had the weather chanced to be foggy, she would have run on shore and been in all probability lost. On this occasion the ebb tide appears to have set diagonally across the Estuary about E.S.E., and at the rate of 2 knots per hour; being evidently thrown off to the southward by Mille-Vaches point and its shoal. During the flood tide, however, it must be remembered that no such stream will be found; on the contrary, there is reason to believe that the remark of Mr. Lambly (the experienced harbour-master of Quebec) will then prove correct, that "the current between Bicquette and Mille-Vaches point sets to the N.E., instead of E.S.E.," for the eddy flood (page 25) meets the proper flood flowing up along the Bank of Soundings, and between Bicquette and Bic, and the united streams are turned off to the northward after the first quarter flood.

BICQUETTE to GREEN ISLAND.—From the lighthouse on Bicquette island the lighthouse on Green island, which shows a *fixed* light, bears S.W. by W. $\frac{3}{4}$ W., distant 30$\frac{1}{2}$ miles;* and the light can be seen, in clear weather, from a distance of 17 or 18 miles, at an elevation of 60 feet above the sea. The lighthouse stands on the north side of the island, and when first seen, from a vessel on the south Bank of Soundings, appears like a white sail a short distance from the shore (page 106).

In running up to Green island, after passing the North-west reef of Bicquette, a W. by S. $\frac{3}{4}$ S. course will, in general, take a vessel along the edge of the bank up as high as the Razades; but above those islets both flood and ebb set to the south-east, and render it necessary to steer more to the westward, or even to the northward of West with a scant northerly wind. But the lead, and a reference to the soundings in the chart, are the only sure guides. With an easterly wind the fog will seldom be so thick as to prevent either the Razades, Basque, or Apple islands from being seen in

* *See* Chart:—River St. Lawrence, below Quebec, Sheet 2, No. 312; scale, $m = 0{\cdot}5$ of an inch.

the day-time. They may be safely approached by the lead, and an attempt should be made to make the two last, especially Apple island, which is bold-to on the north side, in order that the position of the vessel may be exactly ascertained before hauling out into deep water, for the purpose of clearing the dangerous Green Island reef. In the circumstances we are supposing, of an easterly wind with fog in the day-time, it is much more safe to attempt to make Apple island than the lighthouse, since a vessel can approach within less than 2 cables of the former, but would be ashore before she saw the latter if the fog were thick, since the reef extends nearly 1½ miles to the north-eastward of it.

Having succeeded in making Apple island, the vessel may be sheered out to the edge of the Bank of Soundings; and as the distance is short, it is easy to judge when she is coming near the reef, taking, of course the tide into account, whether it be flood or ebb, and keeping the lead constantly going. Then, if the lighthouse be not seen, sheer out to the northward into more than 30 fathoms water, and shape a course up towards the Brandy Pots, according to the tide.

If the lighthouse be seen, or the light at night, there is still less difficulty in avoiding the reef, and regulating the course afterwards, provided the chart be consulted, the lead used, and the tide considered.

But Green Island reef is extremely dangerous, and is rendered doubly so by the strong tides which set upon it, and which produce breaking ripples that try the nerves of strangers during a dark night or foggy weather. Therefore, in a strong easterly gale, dark night, fog or snow so thick that there is little chance of seeing the light, the attempt to run through between Red and Green islands will be attended with great risk, especially during the ebb tide, which, coming from between Hare Island reef and Red islet, sets over towards the Green Island reef, at the rate of 5 knots. It requires an experienced pilot to take a vessel safely through this dangerous passage under these circumstances: it will, therefore, be prudent, in the case of a vessel approaching Bic, in such weather, towards the close of the day, and without a pilot, rather to heave to, or stand on and off the south bank, than run this risk, although there may be some danger in so doing from other vessels running up.

If the soundings about Bic be well known, or that island, or Bicquette, has been seen, the safest plan would be to run under the lee, and anchor to the westward of them, in from 8 to 10 fathoms low water (page 101), where the holding ground is excellent, and the vessel would ride in safety till daylight. Even as far as 6 or 7 miles to the westward of these islands, in from 12 to 13 fathoms at low water, the *Gulnare* rode out a heavy breeze from the eastward; the sea,

although considerable, being nothing in comparison with that which was running, at the same time, in the deep water outside of her and off the bank.

BEATING up from POINT de MONTS to GREEN ISLAND, against westerly winds, which are almost always accompanied with clear weather, there is little difficulty, with the assistance of the charts, other than that which arises from the set of the tides and currents.

It requires a tolerably good sailing vessel, and a flood tide, to beat past Point de Monts against a wind right out; but short boards round the point, and along the north coast, up to Cape St. Nicholas, will most readily succeed. It is not, however, advisable to keep this shore close aboard much farther to the westward, lest the wind should fall to a calm, for there is a strong indraught towards the mouth of Manicouagon river, during the flood tide; and if an easterly wind should chance to spring up, after the vessel had been drifted in near the mouth of English bay, it might be difficult to beat out, or to weather the eastern side of the Manicouagon shoals. The light on Point de Monts cannot be seen on any bearing to the southward of East, being intercepted by the high land to the westward of it; and when it disappears, a vessel off Goodbout river will be only 1 mile from the bar, or off Cape St. Nicholas little more than 2 miles off shore; so that it is a safe rule, in standing in towards the coast at night, to tack as soon as the light bears E. $\frac{1}{2}$ N.

When the ebb makes, stretch over to the southward into the middle of the Estuary, where that tide is less strong than near either shore; but do not go farther to the southward, and be back again to the north coast at the return of flood.

The best time to get past Point de Monts, when fine weather and westerly winds prevail, is at night, or in the first hours of the morning, for then vessels are often assisted by a northerly land wind. If it has blown fresh from the westward during the preceding day a heavy head sea may be expected off the pitch of the point; the flood from along the land in the direction of the Seven islands meeting the downward current off the point assists in causing this.

If, after passing Point de Monts in the morning, with a northerly land wind, there are signs of its dying away, or veering to the westward as the day advances, continue the board to the southward and westward, instead of tacking to keep the north land on board, as directed when the wind is settled right down; for the land wind of the night will probably be succeeded by the fine weather day wind, which usually becomes a steady breeze about 9 a.m., after commencing at W.S.W., and thus affords an advantageous board towards the north coast.

In the fine weather of the summer the wind will probably veer by degrees during the day back to West and W.N.W., thus offering another good board to the south-westward. Pilots and others, who are experienced in reading the indications of the winds and weather, frequently gain more ground to the westward by calculating upon these probable changes of the wind, than by keeping on the north shore out of the current.

With the exception of the low points of Manicouagon, Bersimis, and Mille-Vaches, of which the seaman has already been warned (page 42), the land can in general be plainly seen at night during the continuance of westerly winds; and where its features are sufficiently remarkable, there will be little difficulty in making it out, from its representation in the Admiralty charts. Mount Camille, especially, being an isolated mountain, 2,036 feet above high water mark, can easily be distinguished; as well as the summit of the high land of Bic, 1,234 feet high. Their bearings will often be of great service to vessels in clear nights, and will show when they are high enough up to fetch Father point; where a pilot should be sought for, if one has not been already obtained (pages 41, 96).

On arriving off Father point, or anywhere between it and Bic, if the flood be done and the wind be light, it will be better to anchor on the Bank of Soundings, weighing again, if there be a breeze, in sufficient time to stand over and meet the first of the flood on the north shore. By this mode of proceeding, vessels will gain much more ground to the westward than by remaining on the south shore, for although there be a weak stream of flood upon the Bank of Soundings, from Father point to the island of Bic, yet there is little above that island, and none after the first quarter flood, excepting so close in shore as to be useless to large vessels.

From the bay of Mille-Vaches to within 3 miles of the entrance of the Saguenay river, with the exception of a shoal extending a short distance off shore from the bay next westward of Cape Bondesir, the coast is moderately high and very bold, the flood strong, and the ebb comparatively weak. Vessels should, therefore, make short boards along this shore until up to Bergeron coves, and then stretch over to the anchorage under Green Island reef, to wait for the next flood; for it will require a whole tide, even with a good working breeze, and a fair sailing merchant vessel, to beat through between Green island and Red islet, and reach good anchorage above, before the ebb makes.

CAUTION.—In standing across from the north shore, beware of the Red Islet bank, which extends $2\frac{1}{2}$ miles to the eastward, from the low shingle islet of the same name, as shown by the *red* buoy, which is now moored on its east end in $5\frac{1}{2}$ fathoms at low water, with the lighthouse on Red islet, which shows a *fixed red* light, bearing S.W. $\frac{1}{2}$ W., and distant

$2\frac{8}{10}$ miles (page 242). There is another *red* buoy on the west end of the Red island bank.

A beacon has been erected above and behind the lighthouse on Green island, to lead vessels clear this danger, and it answers the purpose extremely well. It is *white*, like the lighthouse, but much smaller; and when they are in one bearing, S.S.E. the beacon appears in the middle of a lane cut through woods behind it. A vessel standing over with this leading mark on, will pass over the tail of the Red Islet bank, in from 5 to 8 fathoms, according to the time of tide. This beacon will be readily distinguished in the day time; but if a stranger should have any doubt of it, let him be sure not to bring the Green island lighthouse, or light at night, to bear at all to the eastward of S. by E. $\frac{3}{4}$ E., and he will be in no danger. Crossing, below the bank, with the light upon that bearing, there will be found from 9 to 12 fathoms, according to the time of tide, at a mile distance from the bank.

Violent breaking and whirling ripplings of the tide, which can be heard at a great distance in a still night, will be met with in crossing, and are alarming enough to strangers, but there is no danger with the lead going, and an anchor clear to let go in the event of its suddenly falling calm near the bank.

Red Islet bank is, however, very dangerous, and the first of the floods sets strongly over it, in a direction from Bergeron coves towards Green island. The ebb out of the Saguenay also sets upon it, so that a stranger should not make too free with it. If a vessel cannot fetch the anchorage under Green Island reef, she may anchor anywhere, in fine weather, along the south bank between Bic and Green island, and will have good ground in 12 fathoms at low water, and plenty of room to get under weigh.

In coming up with a north-west wind, the north shore should be kept close aboard until up to Bergeron, and if it be flood tide the vessel may pass either northward or southward of Red islet, as may be preferred, but the former passage should not be attempted with this wind during the ebb, nor yet the other, except by those who are well acquainted with the set of the tides.

Although the passage to the northward of Red islet is the quickest, there being a much stronger stream of flood in that channel, yet it cannot by any means be recommended: on the contrary, it should never be attempted unless the breeze appears certain to continue, for if it fell calm, the vessel would run great risk of being drawn in by the stream of flood among the dangerous shoals off the mouth of the Saguenay, or being set down upon Red Islet bank when the rapid ebb made out of that river, which is so strong and the water so deep, that no anchor would hold.

To pass to the southward of Red islet with the same wind, haul round the east end of the reef, and as close to the southward of it as is prudent coming no nearer than 20 fathoms until past the islet. To those who are well acquainted both with the soundings and set of the tides, it may be desirable to keep closer in attempting the passage with an ebb tide, but it cannot be recommended to strangers.

More full directions for this part of the river will be given at the commencement of Part II., Chap. X., which will begin at Green island.*

DIRECTIONS down the ESTUARY and GULF.— For the return voyage down the Estuary and Gulf, little or no instruction seems necessary, as long as the wind remains fair and the weather clear, beyond what may be gathered from the Admiralty charts and the preceding remarks. But where vessels are met by easterly winds and thick weather anywhere above Point de Monts, great caution, attention to the soundings and set of the tides and currents, become necessary to ensure safety, particularly during the long nights and wild weather in the fall of the year.

Vessels beating down the St. Lawrence usually stop at the Brandy Pots for a fair wind. But supposing, after they have passed Green island, that the fair wind fails, and they are met with an easterly wind before they have arrived near the island of Bic, they should, in that case, run up again to the Brandy Pots, especially if late, or very early in the navigable season; for all that they will gain by beating about in thick weather, probably for several days and nights in succession, will not be worth the risk. But if they have reached far enough down at the commencement of the adverse wind, the island of Bic affords good shelter and anchorage, which should be sought in time, before the fog commences (page 101).

There is no other anchorage which can be recommended lower down nearer than the Seven islands, and after that Gaspé. There are other places, which will be mentioned hereafter, in some of which vessels ride for taking in timber, but there they are moored close in shore, with lower yards and topmasts struck, by which means they ride out bad weather, with very indifferent shelter; but such places are not fit for occasional anchorages, or for a heavy laden ship to run for on an emergency.

In a vessel beating down, the south bank should be the guide in thick weather, or at night. She should tack from it, after striking soundings on its edge, and should not stand to the northward more than half-channel

* The light on Red islet, and the buoys recently placed on its bank, together with the buoys on the shoals off the entrance of the Saguenay (*see* pages 241–257) have greatly lessened the difficulty of this navigation.

over in any part: thus keeping in the strength of the downward current, and avoiding the possibility of accident from the shoals of the north coast, which being very steep, and affording little or no warning by the lead, have proved fatal to many vessels under these circumstances.

EFFECTS of TIDES.—It will be almost always seen when the vessel comes upon the south bank of soundings, by there being so much less sea there than in the deep water, and strength of the weather current, outside: a strong ripple will be observed at the edge of the bank during the flood tide.

In the board from near Bicquette, during the flood tide, the vessel will go to the northward rather faster than to the southward back again, whilst in the ebb, the contrary will be the case. But above the Razade islets, she will go much faster to the southward than to the northward, in both tides. Lower down the Estuary, and as far down as Cape St. Anne, she will generally go faster to the southward than to the northward during the ebb tide: whilst in the flood, an indraught into the rivers will be felt on approaching near the north coast from Bersimis point, nearly down to Cape St. Nicholas. The least reflection upon what has been said of the set of the tides and currents (pages 27, 28) will account for these effects.

CAUTION.—In a vessel beating down in a dark night, or thick weather, there is no safety unless the lead be kept constantly going: when she is approaching the south coast, in the board to the southward, sail should be sufficiently reduced for soundings to be easily obtained, and everything in readiness to tack, or veer, at the shortest notice. These precautions become the more necessary as the vessel descends the Estuary, and the bank of soundings becomes narrower. Off Matan there are 30 fathoms, sandy bottom, $1\frac{1}{2}$ miles off shore; and 60 fathoms, at 3 miles off: whilst, at the distance of 5 miles from the land, no bottom will be found at 100 fathoms. The south bank becomes narrower still to the eastward of Matan, and ceases, in consequence, to be of use to vessels. Off Cape Chatte there are 30 fathoms water, little more than half a mile from the shore; a short distance farther off there are no soundings at 70 fathoms; and between it and the Point de Monts, from 150 to 170 fathoms, blue mud bottom.

BELOW POINT de MONTS there is plenty of sea-room, and although the lead will there be of little use, yet the south coast is so high and bold that it may generally be seen, if the fog be no thicker than is usual with a regular easterly wind up the St. Lawrence.

Lower down still, with a beating wind and thick weather, soundings may be struck off the west end of Anticosti, or between the West and South-west points of that island, if it be wished to ascertain how far the

vessel is over to the northward before night. Eastward of the South-west point of Anticosti, to Pavilion river, the bank of soundings off the south side of the island is very narrow; but from the latter to the East point, there is plenty of warning by the deep sea lead, as will be seen by the soundings in the chart.

The channel to the northward of Anticosti cannot be recommended in the voyage down the St. Lawrence, because there is not only less room, but also less current in favour; neither the route by the Strait of Belle Isle, on account of the straggling icebergs, which are in general to be met with there through all the navigable season. Towards the fall of the year, however, vessels occasionally pass through it, in anticipation of the northerly winds which prevail at that season in the Atlantic; they should be well acquainted with the currents, and should know the anchorages on the north side of the Strait, noticed in pages 129 to 133.

The foregoing general directions have purposely not been interrupted by particular descriptions of the coasts, or places, alluded to; the latter, together with directions for the harbours, anchorages, and dangers, will be found in the following Chapters.

CHAPTER IV.

ISLANDS IN THE GULF OF ST. LAWRENCE.

VARIATION, 25° to 27½° WEST in 1860.

ST. PAUL ISLAND, lying in the main entrance to the Gulf of St. Lawrence, between the south-west extreme of Newfoundland, and the north extreme of Cape Breton island, is composed of primary rocks, principally mica slate, dipping at an angle of not less than 45° to the southward.* It is nearly 3 miles long, by one mile broad. Its north-east point is a small detached islet, (although it does not appear as such from the sea,) which is separated by a very narrow channel from a peninsula, between 300 and 400 feet high, which, together with the isthmus, is so precipitous as to be nearly inaccessible. The remaining greater part of the island, which is also steep and precipitous towards the sea, has two parallel ranges of hills, that on the eastern coast being the highest, and attaining an elevation of 450 feet.

A valley runs through between these hills, having two small lakes or ponds 200 or 300 feet above the sea. These supply the principal stream on the island, which is about 2 yards wide, of yellowish brown water, well-tasted and wholesome, and descending into the sea in the southern part of Trinity cove. There are several other, but much smaller runs of water, one of which is into Atlantic cove. These two coves are nearly a mile from the south-west extremity of the island, the first being on the Gulf side, and the other on that which is towards the Atlantic, as its name implies. They afford the only shelter for boats, and the only good landing on the island, which is easier of ascent from them than at any other part.

The island is partially wooded with dwarf and scrubby spruce trees, useless, excepting for fuel. The only inhabitants are two men, in charge of a depôt of provisions for the relief of shipwrecked persons, supported by the government of New Brunswick. These men reside on the north point of Trinity cove, where there is a dwelling-house and store. They grow a few potatoes, and shoot ducks during the winter,

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* *See* Plan of St. Paul Island, with views, No. 304; scale, *m* = 1·0 inch; and Magdalen Islands with views, No. 1,134; scale, *m* = 0·23 of an inch.

and also in the spring and autumn. A very few foxes are the only wild animals upon the island; there is no feathered game, or anything else to support life. The ocean, however, compensates for the deficiencies of the land; codfish and halibut are often plentiful around the island, and mackarel and herrings may be taken at times in their seasons.

ANCHORAGE.—Off Trinity and Atlantic coves small fishing schooners anchor, with the wind off shore, in 10 or 12 fathoms, sand and gravel bottom, and at the distance of 2 cables from the rocks. In very fine weather large vessels might venture to ride with a stream anchor, in from 25 to 30 fathoms, about half a mile off shore, but should be in constant readiness to weigh at the first sign of a change in the wind or weather. Farther off shore the water becomes extremely deep, so that there is little or no warning by the lead in approaching this island in foggy weather. On this account, although so bold and high, it is extremely dangerous, and many shipwrecks have taken place upon its shores, attended with a most melancholy sacrifice of human life.

The irregularity of the tidal streams and currents add much to the danger arising from the fogs, which prevail in southerly, easterly, and often also with south-west winds. During the whole of a fine calm day at the end of June, the current set to the south-east, at the rate of one knot past the north point of the island.

LIGHTS.—Two lighthouses stand on St. Paul island, one on the detached rock within 26 feet of the north point of the island, and the other on the extreme south-west point (page 30).

The lighthouse on the rock is 40 feet high, of an octagon shape, constructed of wood and painted white. It exhibits a *fixed white* light, which can be seen from a vessel on any bearing, excepting between N. by E. and E. by N., when it is hidden by the island.

The lighthouse on the south-west point, also an octagonal white building of wood, and 40 feet high, exhibits a *revolving white* light, which is visible on all bearings, except between S.S.E. and West, when it is concealed by the intervening land. Both lights are elevated 140 feet above the level of the sea, and when the weather is clear, they may be seen from a distance of 18 miles. In fogs a bell is sounded, and a gun fired every *four* hours from the lighthouse on the south-west point. A boat is kept on the island.

BIRD ROCKS, lying about N.N.W., 55 miles from St. Paul island, are of coarse red sandstone, or conglomerate, in strata dipping very slightly to the south-west, and are constantly diminishing in size from the action of the sea. They present perpendicular cliffs on every side; yet it is possible to ascend them with great difficulty in one or two places,

but there is no landing upon them except in the calmest sea. Every ledge and fissure of the cliffs is occupied by gannets, and the summits of both rocks are literally covered with them. The white plumage of these birds gives these rocks the appearance of being capped with snow, and renders them visible through a night glass in a clear and moonlight night from the distance of 7 or 8 miles.

The two rocks bear from each other N.N.W. $\frac{1}{2}$ W. and S.S.E. $\frac{1}{2}$ E., and are 7 cables apart. Sunken rocks leave only a boat passage between them. The south-easternmost is the largest and highest, though scarcely 2 cables long, and not more than 140 feet high above the sea. The other is divided into two precipitous mounds joined together by a low ledge. The lesser of these mounds resembles a tower. A reef extends 7 cables to the eastward, from the Little or north-west Bird rock, and there is a patch of breakers nearly midway between the two, and rather to the south-west of a line drawn from one to the other. The Great, or south-east Bird rock, is quite bold, excepting in the direction of the other rock. The Little Bird rock, bears N.E. by E. $\frac{1}{2}$ E., distant 16$\frac{1}{4}$ miles from the East point of the Magdalen islands, and E. $\frac{3}{4}$ S. 10$\frac{3}{4}$ miles from the east end of Bryon island.

The soundings off the Bird rocks to the eastward, have been already stated in page 31 ; they extend still farther off to the northward, so as to afford the most ample warning and assistance to vessels at night, or in foggy weather, as will be seen in the chart. Between them and the East point of the Magdalen islands, the depth nowhere exceeds 16 or 17 fathoms, over a bottom of reddish sand, and sea-eggs are very frequently brought up by the lead.

CAUTION.—Between the Bird rocks and Bryon island there is a ridge of rocky and foul ground, on some parts of which, it has been said, there is as little as 4 fathoms water, because bottom has been seen in calm weather. Nothing, however, less than 7 fathoms could be found ; but it may nevertheless exist, so that a vessel of large draught had better not cross this ridge when there is much sea running. The two cliffy points on the north side of Bryon island, in one, mark the northern limits of this rocky ground.

BRYON ISLAND, which is uninhabited, is rather more than 4 miles long, in a W. by N. and E. by S. direction, with the extreme breadth of rather more than a mile. Its eastern end bears from the east point of the Magdalen islands, N. by E. $\frac{1}{2}$ E. 10$\frac{1}{2}$ miles, but its south-west point approaches to within 8$\frac{3}{4}$ miles of the North cape of those islands. There was no opportunity of measuring the height of Bryon island, but it nowhere exceeds 200 feet above the sea. The cliffs on the north side

are much higher than those on the south, where there are several small coves in which boats may land easily with the wind off shore.

This island is formed of alternating and nearly horizontal strata of red sandstone, red ochreous clay, and shaley grey sandstone. These rocks are soft and friable, forming perpendicular or overhanging cliffs nearly all round the island, which are broken in holes and caverns, showing how fast they are giving way to the action of the waves. The soil is similar to that of the Magdalen islands. A great part of the island is wooded with dwarf spruce trees, and there is a large upland tract covered with good native grass.

Water.—Water is neither plentiful nor easy to be obtained at Bryon island, but it may be had in small quantities by digging, and there is a spring on the north side of the narrow isthmus which joins the eastern peninsula to the remainder of the island.

Reefs.—There are three reefs off Bryon island. One off its east end extends nearly three-quarters of a mile to the north-eastward; another off the west end extends $1\frac{1}{2}$ miles to the westward; and the third, off the sandy south-west point, $1\frac{1}{3}$ miles to the southward. No marks can be given for clearing these reefs, but the bearings of the land will afford sufficient guidance to the seaman. The reef off the south-west point is so much in the way of vessels passing between it and the Magdalen islands, that it may be useful to add, that from the southern ridge of this reef Bryon island subtends an angle of 97°, so that with the island subtending any less angle the reef may be passed. The south reef assists greatly in turning off the sea from the roadstead to the eastward of it, where vessels may safely anchor in 6 fathoms water and a sandy bottom, at the distance of a mile or more from the shore, and with all winds from N.E., round by north, to W.N.W. Small vessels in heavy north-west gales lie at anchor close under the reef.

There are regular soundings from 9 to 11 fathoms, with sandy bottom between Bryon and the Magdalen islands, with the exception of an extensive patch of foul and rocky ground, lying between S.W. $\frac{1}{2}$ W. and W.S.W. from the west end of Bryon island, and having a clear channel on either side of it, as will be seen in the chart. Not less than 5 fathoms could be found here, and although the fishermen see bottom upon it in calm weather, there is every reason to think that there is no less water. Nevertheless vessels of large draught had better not run over it, when there is a heavy sea running, for a small point of rock, with a few feet less water, might escape the most rigorous examination.

The rocky places are called fishing grounds by the inhabitants of the

Magdalen islands, because codfish abound upon them. There is one carrying 11 fathoms water, 2½ miles North of Bryon island, and which extends a considerable distance parallel to the island. There is sandy bottom, and a greater depth of water within this ridge, and vessels may anchor in fine weather and southerly winds, off the bay on the north side of the island. The soundings extend so far off Bryon island to seaward in every direction, that there is no possibility of a vessel on a voyage being endangered by it, if the lead be used. But great caution is requisite in approaching the reefs, for they are very steep, especially that which extends to the southward.

MAGDALEN ISLANDS.—This chain of islands assume an irregular curved direction, the greatest length of which, from the south-west cape of Amherst island to the east point, is 35 miles; but if the smaller isles be included, as they evidently form a part of the Magdalen group, the whole length of the range, from the Deadman to the Great Bird rock, is 56 miles, is an E.N.E. direction.*

The central parts of these islands rise into hills, with rounded and frequently dome-shaped summits, attaining an elevation above the sea varying from 200 to 580 feet, and which are in general of igneous, or trap [illegible]. Around, and on the flanks of these hills, are stratified deposits of sandstone and ochreous clays, with gypsum in the hollows and basins, and also occasionally in veins. No rock-salt has been found upon the islands, but the water of many springs and small streams is sufficiently saline to be nearly unfit for use. The gypsum forms an article of commerce, and some valuable ochreous pigments are also found upon the islands, but the principal dependence of the inhabitants is upon the cod-fishery. The herring and seal fisheries are also prosecuted to a limited extent.

The islands are partially wooded, but the trees are small, and mostly spruce, juniper, birch, and canadian poplar. The unwooded parts produce good grass, and afford pasturage for cattle and sheep; but they are far less abundant than the pigs, which are fed upon the offal of the fish, and make very bad meat in consequence. The general character of the soil is sterile, for although good vegetable mould may occasionally be met with, yet, on examination, it usually proves to be superficial, being only a few inches in depth, and having beneath it either the rock or siliceous and ferruginous sands. The climate is severe; not quite so cold as at Quebec in winter, but less warm in summer. Rains, and especially fogs, are extremely frequent, and without this humid atmosphere the islands would be deprived of the little fertility which they

* *See* Chart of the Magdalen Islands, with views, No. 1,134; scale, $m = 0{\cdot}23$ of an inch.

possess; the dry and meagre soil requiring copious and continual supplies of moisture.

When first made from sea, the Magdalen islands appear like several hilly islands, with channels between, but, on a nearer approach, they are seen to be all connected together, with the exception of Entry island, by a double line of sand-bars and beaches, inclosing extensive lagoons, having very narrow entrances, by which the tide finds access and egress. These sand-bars are in some parts only a few feet above the sea, whilst in others they rise into hills of blown sand of considerable elevation. They appear to be increasing, since there are generally ridges of sand with from 9 to 12 feet water parallel to, and from 50 to 100 fathoms outside the beach. There are 3 and 4 fathoms water between these ridges and the shore, a circumstance which has often proved fatal to the crews of vessels wrecked upon these shores. These hilly islands thus disposed in a curvilinear shape, and connected together by sand-bars, inclosing lagoons, remind one forcibly of those islands in tropical seas which are connected together by coral reefs.

In a bright sunny day of summer, the cliffs of various colours in which different shades of red predominate, and the yellow of the sand-bars contrasted with the green pastures of the hill sides, the darker green of the spruce trees, and the blue of sea and sky, produce an effect extremely beautiful, and one which distinguishes these islands from anything else in the Gulf of St. Lawrence. In stormy weather, the appearance is equally characteristic. Isolated hills and craggy cliffs are then dimly seen through the rain and mist which accompany an easterly gale, and appear joined by long ranges of breakers, which almost hide the sand-bars. At such times it is dangerous to attempt making the islands, for in approaching the lower parts, the breakers would probably be the first thing seen from a vessel.

Population.—There are at present, in 1860, upon the Magdalen islands about 1,100 inhabitants, the majority of whom are of French extraction, and who all inhabit Amherst, Grindstone, and Alright islands, with the exception of about 11 or 12 families divided between Entry island, Grosse isle, and East island, near the north-east extremity of the chain.

Supplies.—Vessels may obtain limited supplies of fresh provisions, especially at Entry island, and water most readily from Amherst harbour, either from a spring which issues from under the Demoiselle hill, or from a small stream which falls into Ance à la Cabane, near the south-west cape of the island. Wood for fuel is becoming scarce near the settlements. Large spars are not to be had, unless when they chance to be saved from wrecks, but small ones, of spruce and juniper may be obtained. The latter,

of which the inhabitants build their fishing-boats and shallops or small schooners, somewhat resembles larch-wood; it is said to be extremely strong and durable.

The Magdalen islands possess no harbour for ships, but three for small vessels, named Amherst, House, and Grand Entry harbours, which will be noticed in the following concise description of the shores of the islands and the dangers off them.

EAST POINT, forming the north-east extreme of the Magdalen islands, is of low sand, inclosing several shallow ponds, and having several sand-hills, some of which are near its extremity, while others, of greater elevation and farther to the westward, extend in a chain nearly to the North-east cape. These last-mentioned sand-hills are inland, and on the margin of the north-eastern part of the great lagoon. The North-east cape is a hill on East island, at the head of Grand Entry harbour. It is a remarkable cape, and its isolated cliffs, being 230 feet high, can be seen over all the sand-hills and sand-bars, so that, when these last are below the horizon, the cape appears to be the eastern extremity of the chain.

LONG SPIT is a ridge of sand, with from 2 to 3 fathoms water, which extends S. . $\frac{1}{2}$ S. rather more than $1\frac{1}{2}$ miles off East point, and for $1\frac{1}{4}$ miles farther in the same direction, the depth is from 4 to 6 fathoms. To clear this spit observe, that the southern part of Coffin island is a peninsula, forming the southern shore of the Oyster pond, and connected to the remainder of the island by a low neck or isthmus at the west end of the pond. Now, the mark for the 3 fathoms extremity of the spit is the north side of this peninsula on with the Old Harry head. And the south side of the northern part of Coffin island, (where the narrow neck joins it, as above mentioned,) on with the Old Harry head will lead over the spit in 4 fathoms.

The mariner with the chart before him will have little difficulty in making out these leading marks, but may, if he pleases, pass round the spit, by the lead, in 5 or 6 fathoms, taking care not to bring the Old Harry to bear to the southward of West. To know when a vessel from the eastward has passed it, observe that the line of the summit of the North cape on with the east side of the North-east cape leads nearly half a mile to the south-west, which mark will also be useful to a vessel approaching it from the westward. The tides set rapidly over this spit, and, together with the shoal water, cause a heavy breaking sea. It is extremely dangerous, and vessels should take care not to get becalmed near it without an anchor clear.

DOYLE REEF lies S.E. $\frac{1}{2}$ E., distant $6\frac{3}{4}$ miles from the East point of the Magdalen islands, and consists of pointed rocks. It is very small, being

only 3 cables long, and half a cable wide from the depth of 6 fathoms to 6 fathoms on either side of it. The least water is 3 fathoms on one spot nearly in the centre, and there are 12 and 13 fathoms all around it. The only mark for this reef is the North cape of the Magdalen islands, open two-thirds of its breadth to the north-east of the North-east cape. On the reef, the angle between these marks and the western point of Coffin island is 24° 27′.

Lying completely in the way of vessels, and very seldom showing, the sea breaking upon it only in heavy gales, Doyle reef may justly be considered as one of the worst dangers off the Magdalen islands. It was examined and laid down for the first time during the Admiralty survey of this part of the Gulf, and was previously known only to a few persons on the islands, who reported that they had at different times seen vessels disappear, which they concluded had struck upon it.

OLD HARRY HEAD, the south-east point of Coffin island, is formed of red sandstone cliffs of moderate height, with a reef off it one third of a mile to the south-east. It is the first headland to the westward of East point, from which it is distant 4½ miles. Between them is a sandy bay, in which vessels may anchor, with good shelter, in all winds from West, round by north, to N.E. ; but it is not a place to be recommended, because a vessel would be there very much embayed by the shoals on either side, and might find it difficult to get out on the occurrence of a sudden shift of wind either at night, or attended with fog.

COLUMBINE SHOALS.—The outermost of these shoals is a patch of rocks with 3 fathoms over it, from which Old Harry head bears N.N.E. ¼ E. 2½ miles. Within this, and towards Coffin island, are numerous small shoal patches and pointed rocks, on some of which there are not more than 3 feet at low water.

These shoals are extremely dangerous, and much in the way of vessels hauling round East point with northerly winds. To clear their east side, the whole of the high North-east cape must be kept well open to the eastward of the Old Harry. There are no good marks for clearing the west side, or for leading clear outside of them, so that the only guide for the latter purpose is not to bring East point to bear to the eastward of N.E., and, for the former, is not to bring the west end of Coffin island to the westward of N.W. ¾ N. But although there are no good marks, an angle with a quadrant will answer the purpose as well and as easily. On the outer edge of these shoals, the angle between Old Harry head and the left or west extremity of Coffin island is 77° ; consequently, with these points subtending any less angle, the vessel will pass outside of the shoals.

COFFIN ISLAND extends 4 miles to the westward of the Old Harry, having on its south side a lagoon with a very narrow outlet, called the Oyster pond, and which boats can only enter in fine weather. Off the coast of the island there are several rocks, besides the Columbine shoals, but as these are in-shore, and out of the way of vessels, it is sufficient to refer to them, and to remark, that this is a very dangerous part of the islands, which should never be approached at night or in foggy weather.

GRAND ENTRY HARBOUR has its entrance between the south-west end of Coffin island and [illegible] sand bars to the westward of it, and has water enough within for large vessels; but its entrance is extremely narrow, not exceeding 100 yards in breadth, and the narrow channel leading to it, between sandy shoals which are said to shift, extends 1⅓ miles to the westward. These circumstances render instructions for entering it of no avail. A native pilot should be employed, or the channel buoyed or staked, and even then the entrance should not be attempted excepting with a leading wind, flowing tide, and fine weather. The depth that can be carried in, at low water, is 10 feet; at high water, neap tides, 12 feet; and in spring tides, 13 feet. There are 28 feet water at, and immediately within, the entrance. The ebb tide runs out with great rapidity, and the flood in is also strong. There are no settlements at the harbour, but there are a few families in the vicinity of the North-east cape who breed cattle, and are of British extraction.*

Within this harbour there is a large expanse of water, from 1 to 3 fathoms deep, extending north-eastward to the southern shores of Grosse isle, and communicating by a very narrow channel with a large shallow pond, which washes the base of the North-east cape, and extends to within about 2 miles of the eastern extremity of the chain. This great lagoon also extends south-westward, between a double line of sand-bars, to the eastern shores of Grindstone island, and is, in all, 23 miles long, and from half a mile to 3 miles wide. Throughout its whole extent there is a communication for boats at high water, quite sheltered from the sea. There are at present three entrances into this lagoon from the sea, namely, Grand Entry harbour; another 3½ miles to the westward, which is very shallow; and House harbour, near its south-west extremity, between Alright and Grindstone islands. There were formerly others, which have been closed since the time of Des Barres, 1778; and, on the other hand, the second mentioned above, has opened since his time.

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* *See* Plan of Grand Entry Harbour, No. 1,144; scale, m=3 inches.

SHAG ISLAND is small and low, and of sandstone, lying off the east coast of the Magdalen islands, about half a mile from the sand-bars, nearly midway between Coffin and Alright islands, and out of the way of vessels.

CAPE ALRIGHT, bearing W. by S. ½ S. 16½ miles, from the Old Harry Head, is the southern point of Alright island, and a remarkable headland. The cliffs, of a greyish-white colour, with occasional brick-red low down, are 400 feet high at the highest part, which is about a mile to the eastward of the cape, and those to the westward of the cape, towards House harbour, are also very high, and of the same colour. Nearly a mile inland is the summit of Alright island, 420 feet above the sea. Between this summit and the cape there is a remarkable hill, named Bute-Ronde. The south extremity of the cape is low, with a small rock close off it.

ALRIGHT REEF, the outer edge of which lies E. ¾ S. 3¼ miles from Cape Alright, is 4 cables long by 3 cables wide, and is composed of white and pointed rocks, having over them 6 feet least water. When on this reef the Bute-Ronde is in one with the summit of Grindstone island; the west side of Cape Alright is in line with the west side of Cape Meules; and the whole of the woody Wolf island is just open to the westward of Shag island. The well marked summit of Grindstone island open to the south-westward of Cape Alright will lead the south-west; and the east side of the woods of Wolf island (seen over the sand-bars) open to the eastward of Shag island, will lead to the south-east.

The north-east point of Entry island bears S. ¼ E., 7 miles, from Cape Alright; and the channel between them leads into Pleasant bay, passing previously between Alright reef and the Pearl reef.

PEARL REEF is small and dangerous, and of white pointed rocks, like most of the reefs around these islands. It is round, and about 2 cables in diameter, with 9 feet least water; and even with a moderate swell the sea breaks heavily upon it. From it Cape Alright bears N.W. ½ N., and is distant 8¼ miles; the north-east point of Entry island W. by S., 4½ miles; the Demoiselle hill is open one quarter of a point to the northward of the cliffs of Entry island, and exactly on with the extremity of the north-west spit, above water, of the same island (this spit, however, can be seldom seen from the reef); and the three high cliffs, on the south-west side of Alright island, are nearly in one, bearing N.W. ¼ N., when the north-westernmost of those cliffs will be seen over the middle one, and between it and the south-easternmost. Hence, keeping all those cliffs open will lead the reef to the westward, of the reef; and the north-westernmost cliff completely shut in behind the other two

will lead to the eastward. The Demoiselle hill shut in behind the north side of Entry island will lead to the southward; and the Demoiselle kept more than half a point open to the northward of Entry island will lead to the northward.

HOUSE HARBOUR is distant 2¾ miles to the north-west from Cape Alright. Its entrance is a narrow and crooked channel, carrying only 6 feet at low water.

RED CAPE, bearing W. ¾ S. 5 miles from Cape Alright, is the southern point of Grindstone island, and the north point of Pleasant bay. The opposite point of the bay, Sandy Hook, is the east point of Amherst island, and bears from the Red cape S. by E. ¼ E., 6 miles. From this line to the shore of Amherst island at the head of the bay, the distance is 4¼ miles. Between Red cape and House harbour is Cape Moule, of grey sandstone, off which there is a rock, with 5 feet of water; and there is another rock, with 3 feet, off the west side of Alright island. These will be seen in the chart, and, as they lie out of the way of vessels, require no farther notice.

GRINDSTONE ISLAND is the second largest of the chain, being, in this respect, intermediate between Amherst and Alright islands. Its summit is elevated 550 feet above the sea at high water.

AMHERST ISLAND, the largest and south-westernmost of the Magdalen islands, is connected with Grindstone island by a double line of sand-bars, inclosing an extensive lagoon, 5 or 6 miles long, and from 1 to 3 miles wide, the southern part of which is called Basque harbour. This lagoon is full of sands, which are dry at low water, and has three outlets into Pleasant bay, the southernmost being the deepest, but having only 3 feet water over its bar at low water. The others, including three through the sand-bars of the north-west coast, will only admit boats at high water, and when the surf is not too high.

The hills in the interior of Amherst island rise to the height of 550 feet above the sea. Towards the south-east part of the island, and about a mile to the N.W. of Amherst harbour, is the very remarkable conical hill, named the Demoiselle, of trap rock, and 280 feet high. The perpendicular and dark red cliffs of the Demoiselle are washed by the waters of Pleasant bay.

AMHERST HARBOUR is formed by a peninsula, presenting cliffs of gray sandstone to seaward, in the south-west corner of Pleasant bay. Its entrance, between this peninsula and the sands to the southward, is 2⅓ miles within, or to the westward of the extremity of Sandy Hook, which

is a long and narrow sandy point with sand-hills. This harbour is the easiest of access and egress of any in the Magdalen islands, and has, moreover, the advantage of an excellent roadstead outside, where vessels may wait their opportunity of running in. Nevertheless, its entrance is extremely narrow and rather crooked, so that, without a pilot, it would be necessary to buoy or stake the channel. The depth over the bar, which is rocky, is 7 feet at low and from 9 to 10 feet at high water, according as it may be neap or spring tides. Within the harbour there are from 12 to 17 feet, over a bottom of soft, black, and fetid mud, well sheltered from every wind.*

PLEASANT BAY is the best roadstead in the Magdalen islands, and the only one where vessels can venture to lie with all winds, during the three finest months of summer, June, July, and August. In those months, a gale of wind from the eastward, so heavy as to endanger a vessel with good anchors and cables, does not occur above once in three or four years. The riding, however, is often heavy and rough enough in north-east gales, and a vessel should be well moored with a whole cable on each anchor, and open hawse to seaward, and all snug aloft.

The best and most sheltered anchorage is in 4 fathoms, with the rocky point of entrance of Amherst harbour bearing S.W. $\frac{3}{4}$ W., two-thirds of a mile, and a little more than half a mile from high water mark on the sandy beach to the southward, when a remarkable and high sand hill will bear S. $\frac{1}{4}$ E. A vessel of large draught should anchor farther off, and should take notice that there is only from 3 to $3\frac{1}{2}$ fathoms in one part of the bay, as will be seen in the chart. The bottom is everywhere excellent for holding, and of red sandy clay.

A vessel anchored as above, will be sheltered from E. by N. $\frac{1}{2}$ N., round south and west, to N.E. $\frac{1}{2}$ N., and will, consequently, have only 3 points completely open. Even when the wind comes right in, the sea is much lessened by passing over so much of shoal water; nevertheless, the attempt to ride out a heavy easterly gale, either before June, or after August, will be attended with great danger; and Pleasant bay cannot be recommended as a desirable place under such circumstances at any time of the year. In the northern and western parts of the bay, sandy flats extend more than a mile from the beach.

SANDY-HOOK CHANNEL, between Amherst and Entry islands, is $2\frac{1}{2}$ miles wide, but an extensive sandy shoal runs out 2 miles to the eastward from Sandy-hook, so as to leave a navigable breadth of little more than half a mile between it and the rocky shoals off the west side of

* *See* Plan of Amherst Harbour, No. 1,143; scale, *m* = 3 inches.

Entry island. Four fathoms can be carried through this channel by a good pilot, but 3½ fathoms is the utmost that can be safely reckoned on by a stranger. There are several rocky patches of 2½ fathoms off the south-west point of Entry island, reaching to fully three quarters of a mile from the shore. The ebb tide sets strongly through this channel, and over Sandy hook flat, so that vessels of large draught should go round to the eastward of Entry island, rather than encounter so many difficulties.

DIRECTIONS.—To run through Sandy-hook channel from the southward, keep the east side of Alright island just open to the westward of the shingle and sandy spit forming the north-west point of Entry island, until abreast of the south-west point of the last-named island, then haul up for the summit of Grindstone island, looking out for the edge of the sand shoal to the westward, which can generally be seen.

ENTRY ISLAND is the highest of the Magdalen islands, its summit being 580 feet above the sea at high water. Its red cliffs are magnificent and beautiful, rising at the north-east point to 350 feet, and at the south point to 400 feet of perpendicular height. Off the north-east point there is the High rock, about half a cable's length from the cliffs, and on its north side the remarkable Tower rock, of red sandstone, joined to the island, and which can be seen from the south-west over the low north-west point, as well as from the north-east.

Supplies.—The inhabitants of Entry island raise cattle and sheep, depending more upon the sale of fresh provisions than the fisheries. Vessels may, therefore, almost always obtain supplies.

ANCHORAGE.—Vessels occasionally anchor under Entry island in northerly and easterly winds, but it is rough riding, by reason of the sea which rolls round the island. The best anchorage in easterly winds is in Sandy-hook channel under the north-west spit, in 5 fathoms, sand.

Besides the rocky patches in Sandy-hook channel, and off the south-west point of Entry island, there are others off the south and south-east sides, extending a quarter of a mile off shore.

ANDROMACHE ROCKS are several mere points of rock with deep water between them, lying off the north-east point of Entry island. The two nearest the shore, with 11 feet water, do not extend beyond 1½ cables from High rock. Two others, with 17 feet water, are distant 2 cables and 2½ cables respectively from High rock on the same line of bearing; and lastly, there is a patch, carrying 8½ fathoms, fully one-third of a mile out in the same direction. There is a clear channel between these rocks and the Pearl reef, which lies 4 miles farther off on the same bearing, E. by N. (page 60,) and vessels, passing to the eastward of Entry

island, will therefore be in no danger, if they do not haul round High rock at a less distance than half a mile.

AMHERST ISLAND.—The south coast of Amherst island, consisting of sand-hills and beaches, with shoal water half a mile off, curves round to the westward, for 6 or 7 miles, to the entrance of the Basin, which extends nearly across the island to within less than half a mile of Pleasant bay. The Basin is now so nearly closed with sand, that boats can only enter at high water, and in the finest weather; but, formerly, the entrance was deep enough for large schooners, and it has been frequented by those vessels within the memory of the elder inhabitants. There is good anchorage off the entrance, in from 6 to 9 fathoms, sandy bottom, and with winds from N.W., round by north, to East.

A mile and a half to the westward of the entrance of the Basin, cliffs commence and continue, except in Cabane bay, to the West cape, which is the highest cliff of Amherst island, its summit being 300 feet above the sea. There is a remarkable rock above water close to the shore, and about a quarter of a mile to the southward of it.

CABANE BAY is a small bight, between the South and South-west capes of Amherst island, where vessels may safely anchor with northerly and easterly winds, and where good water may easily be obtained. The best berth is in 8 or 9 fathoms, sandy bottom, off the centre of the bay, with the South cape and Cape Percé in one, three-quarters of a mile off shore.

DEADMAN ISLET, bearing N.W. $\frac{1}{2}$ W., $7\frac{3}{4}$ miles nearly from the West cape of the Magdalen islands, is very small, being not more than 3 cables long, in an E.S.E. direction, and less than half that in breadth. It is about 170 feet high, with steeply sloping sides, meeting at the summit like a prism, so that when seen end on, it resembles a pyramid. When seen from a distance with its longest sides presented to view, its outline very much resembles that of a body laid out for burial, from which circumstance its name is derived. The islet is composed principally of trap rocks, and when seen close to, on a bright sunny day, with the white surf dashing against its variously coloured sides, it is a very beautiful object. It is so bold on the west side, that a vessel may pass within the distance of 2 cables with safety, but a reef extends one-third of a mile towards Amherst island.

About a mile to the northward of this islet there is a rocky fishing ground with 8 fathoms least water; and 6 miles S.S.W. $\frac{1}{2}$ W. of it, there is another with 11 fathoms. There is no danger nearer than the White Horse, and vessels may safely pass between it and Amherst island. It is, however, much in the way of those passing round the west

end of the Magdalen islands, and they should beware of it at night, or in foggy weather, for the lead will give little warning, since there is nearly as much water within half a mile of it as at the distance of several miles.

GULL ISLAND.—From the West cape of Amherst island, the remainder of the sea-coast of Amherst island consists of red cliffs, without beach, but having shoal water one-third of a mile off shore, all the way to West lake, a small pond at the south-west end of the sand-bars which join Amherst and Grindstone islands. At the north-east extremity of these sand-bars is Gull islet, which is small, rocky, and close to the western point of Grindstone island, and has shoal water off its west point to the distance of one-third of a mile. About 1¼ miles to the south-west of it, nearly 1½ miles off the north-west outlet of Basque harbour, and with the west side of Gull islet and Gros Cap in one, lies a rocky shoal with 3 fathoms at low water, and leaving no good passage between it and the shore. Close to the north-east of Gull island is the Etang du Nord, a small inlet affording good shelter to boats.

HOSPITAL ROCK.—The northern shore of Grindstone island is of red sandstone cliffs, less high than those of Amherst island. Near their north-east extreme lies the Hospital rock, close to the shore, and also some rocky 3 fathom patches, more than half a mile from the shore, as will be seen in the chart.

WHITE HORSE is the name of a dangerous reef, lying N.E. by E. ½ E., 7 miles from Deadman islet; and W.N.W., 5¼ miles from Gull islet. It is extremely small, being scarcely more than a cable diameter, and having 10 feet least water over pointed rocks, on which the sea often breaks. On this reef the summit of Entry island is seen over a low part of the sand-bars, at the north-east outlet of Basque harbour, but this mark cannot be easily discerned by a stranger, nor is there any other; but the bearings and distances, together with the chart, will be a sufficient guide.

When on the reef, the western extremity of Amherst island and Hospital cape (the north-eastern extremity of the cliffs of Grindstone island) subtend an angle of 91° 30′; consequently, with these points subtending a less angle by 3 or 4 degrees, the vessel will pass outside of the reef. With a greater angle, 94 or 95 degrees, she will pass inside of it, or between it and the shore.

There are irregular soundings and foul ground between this reef and the shore, but nothing less than 5 fathoms, excepting what has been already mentioned.

PIERRE de GROS CAP, another dangerous reef of rocks, nearly of the same size as the White Horse, and having 18 feet least water, is seldom seen, as the sea breaks upon it only in very heavy weather. It lies N.E. by E. ½ E., 6 miles from the White Horse; N. ¼ E. from the west point of Etang du Nord; N.W. ¾ W. from Hospital Cape, and 3¾ miles off Cape le Trou, the nearest point of Grindstone island.

When on the reef, the summit of Alright island is seen over the north-east point of Grindstone island, which is in the lagoon, and very nearly on with Hospital Cape; and the Bute de Portage, a hill of Amherst island situated about 1½ miles N.W. of the Demoiselle, is midway or in the centre of the narrow passage between Gull island and the west point of Etang du Nord. These marks kept open will lead to the north-east and south-west of the reef; and a vessel will pass well clear outside of it, and also of the White Horse, if Deadman islet be not brought to bear to the westward of S.W. ½ W.

WOLF ISLAND.—From Hospital Cape to Wolf island, off which there is a rocky 3-fathom shoal nearly half a mile from the shore, the northern coast of the Magdalen islands consists merely of sand-beaches and sand-hills, for a distance of 9 or 10 miles. The low sandstone cliffs of Wolf island, which is about three-quarters of a mile long, interrupt the continuance of the sandy shore for only half a mile; the sand-beaches then recommence, and continue, with high sand-hills, occasionally, 9 or 10 miles farther to the North cape. In all this part the sand-bars may be safely approached by the lead as near as 10 or 9 fathoms depth of water.

The NORTH CAPE of the Magdalen islands is the northern point of Grosse isle, and a precipice of considerable height, but not so high as the west point of the same island, which is in the Great lagoon, and 300 feet above the sea.

The north coast of the Magdalen islands continues from the North cape, in a curved line of sand-beaches and sand-hills, for about 6 miles, which distance again brings us to the East point, noticed in page 57, and completes the description of the islands.

NORTH CAPE ROCKS, some of which always show, lie to the westward of North cape, the outermost being 6 cables' lengths off shore. The west end of these rocks bears N.N.W. from the high south-west side of Grosse isle, and their extent to the eastward is marked by the north-east sides of the North and North-east capes in one. Therefore, in running down from the westward to anchor under the North cape, do not come nearer the shore than one mile until the above-named marks are open.

Water may be had in small quantities near the houses on the east side of the North Cape, but there are no good watering-places excepting those already mentioned.

ANCHORAGE.—In the above anchorage, namely, to the eastward of the North Cape, vessels may ride in 8 or 9 fathoms, over sandy bottom, with all southerly winds, and will find good holding ground, and plenty of room to get under weigh.

DIRECTIONS.—Although a general description of the appearance of the Magdalen islands has been given in page 55, yet, as vessels passing to the southward of them have been directed to endeavour to make Entry island, it may be useful to add, that that island, when first made from the eastward, will appear like a double-peaked hill, sloping somewhat abruptly down to perpendicular and high cliffs on either side. The south-west point of Amherst island is also a steep cliff, but of less height, and as there is no land to the southward and westward of it, it cannot be mistaken. The land rises from it in undulations to the higher parts of the island. Should the weather be foggy, the soundings will safely guide vessels passing to the south-eastward of the islands.

The general soundings around the Magdalen islands, which extend off them so many miles in every direction, will afford an invaluable assistance to vessels at night or in foggy weather, and will be better understood from the Admiralty charts than by any written directions.

TIDES.—At Amherst harbour it is high water, full and change, at 8h. 20m.; ordinary springs rise 3 feet, and neaps 2 feet.

The tidal streams or currents around the Magdalen islands are so irregular, that the most experient and intelligent pilots for the islands, who are also fishermen, and have passed their lives in fishing craft around them, can give no certain account of their rate and direction, but all agree in stating that they vary in both respects, either from the effects of winds, or other and unknown causes. Nevertheless, the following observations will hold good as a general rule, and although subject to occasional interruption, the set of the tidal streams about to be described will be found to recur with considerable constancy in fine weather.

A few miles outside of Bryon island and the Bird rocks, there appears to be usually a current setting to the south-eastward, out of the Gulf; but the stream of flood tide flows between them and the Magdalen islands. The stream of flood comes from the south-east, and is divided by the East point of the Magdalen islands. One branch of the stream sets strongly over the Long-spit, which, with the Old Harry Head and the shoals off it, turn it off to the south-westward towards Entry island,

leaving nearly slack water in the bay between Coffin island and Cape Alright, and also in Pleasant bay. The other branch, to the northward of the islands, follows the shore from East point round to the South-west cape of Amherst island, whence the greater part of the stream continues its course to the south-west; whilst the remainder, following the shore, runs round and along the southern coast of Amherst island, until it meets the before mentioned other branch of the stream from the East point, setting off the east side of Entry island. It is overcome by this other branch, and turned gradually round to join the general weak stream of flood to the westward in the offing.

On the south-east side of the islands, the stream of the ebb tide sets strongly out of the lagoons and out of Pleasant bay, between the Sandy-hook and Entry island. It is also often found running to the westward along the southern shores of Amherst island, and right round it in like manner, but contrary in direction, to the course of the flood already described. In the offing, at the same time, the stream of ebb is from the south-west, and sets over the Long-spit off the East point, where it meets the stream from the north-west, which has followed the north shore of the islands round from Amherst island to the East point. The meeting of these two streams of the ebb tide, together with the shoalness of the water, causes so heavy a breaking sea in strong easterly winds, that the fishing shallops dare not venture at times to pass the point.

The rate of either stream seldom amounts to a knot, excepting close in shore, or round the points. The ebb, however, is generally the strongest stream, and its rate is increased by westerly winds, as is that of the flood by winds from the eastward.

ANTICOSTI ISLAND, situated in the entrance of the north-west arm of the Gulf of St. Lawrence, is 122 miles long in a N.W. ½ N. and S.E. ½ S. direction, 30 miles in extreme breadth, and about 270 miles in circumference, following the coast from point to point across the bays. Its shores are everywhere of rock, belonging to one great formation, namely, a very ancient secondary limestone, affording in some parts excellent building stone, of which the two lighthouses have been constructed. On and near the coasts, the limestone is covered with a thick and often impenetrable forest of dwarf spruce, which, in some exposed situations, is only a few feet in height, with gnarled branches, so twisted and matted together, that a man may walk for a considerable distance on their summits. Extensive banks of limestone shingle, bush-swamps, morasses, and also beds of peat are of common occurrence.*

* *See* Chart :—Gulf of St. Lawrence, No. 2,516 ; scale, $d = 3{\cdot}7$ inches.

ASPECT.—Anticosti is nowhere higher than 700 feet above the sea. Its south coast is low and shelving, with reefs of flat limestone which dry at low water. There is, however, a range of highlands in rear of the South-west point, and extending for some miles both to the north-westward and south-eastward of it. The north coast, for 70 or 80 miles to the westward of the East cape, is bold, precipitous, and of considerable elevation. Picturesque headlands, the eastern terminations of parallel ridges of table land, that rise gently with the strata from the south-west, end in magnificent cliffs of limestone, which are externally so nearly white from the effects of the weather, as to resemble chalk. Some of these cliffs are upwards of 400 feet in perpendicular height. The remainder of the north coast is low, with reefs of flat limestone, like the southern shores.

It is unusual to find an island so large as Anticosti without a good harbour. Limestone coasts are in general characterised by deep inlets and bays, peninsulated points, and detached islets and rocks, but nothing of the kind will be found here, and there is not a single detached shoal off any part of the coasts.

The coasts of this island have been generally believed to be extremely dangerous. The reefs of flat limestone, extending in some parts to 1¼ miles from the shore, the want of anchorage off most parts of the coast, and above all the frequent fogs, justify this belief in part, but not in so great a degree, as to render reasonable the dread with which they seem to have been occasionally regarded, and which can only have arisen from the natural tendency to magnify dangers of which we have no precise knowledge.

PRODUCTIONS.—The interior of Anticosti is probably less sterile, for white spruce spars have been seen large enough for the masts of a schooner of 60 tons, and others of juniper (a species of larch), of excellent quality, and of sufficient size to form the keel of a vessel of the same dimensions. Black and white birch, and ash, the latter of bad quality, complete the list of trees which attain to any size upon the island. These, indeed, are not indicative of a very good soil anywhere, but when they attain to large dimensions, some soil at least will be found.

Land birds appear to be very scarce, probably because there are few wild fruits for their support, the cloud berry, on the peaty morasses, being the only one that was observed in any plenty. Even the common Canadian partridge, or wood grouse, to be found almost anywhere else, is said not to exist upon this island. In winter, however, the white partridge, probably ptarmigan or willow grouse, is seen in the interior. There are as few varieties of quadrupeds as of the feathered tribes. The squirrel and Canadian hare, without which there is rarely seen an island of any size in the Canadas, were never seen during the survey, and are reported not to exist here. According to the report of M. Gamache, who has

resided and hunted here for many years, there are only 4 or 5 species of quadrupeds upon the island, namely, the black bear, fox, otter, martin, and a few mice. It is also said that there are neither snakes, toads, nor frogs, and that rats, which have occasionally landed from wrecks, have soon disappeared.

The CLIMATE of Anticosti, from its proximity to an open sea, is probably not more severe in winter than that of Quebec, although farther to the north, but the summers are cold, wet, and stormy, with frequent fogs. Frosts are common in August, and in some severe seasons they occur in every month of the year. It is probable that no other grain but barley would ripen here, unless it might be oats occasionally in sheltered situations. Potatoes are frequently prevented by early frosts from coming to perfection, although planted in the most favourable situations.

It appears, therefore, that not much can ever be expected from the products of the soil, but the forests, the rivers, the reefs, and the surrounding sea, contribute in affording a profitable return to the industry of the few persons who reside upon, or frequent the island.

RIVERS.—Streams of excellent water descend to the sea on every part of the coasts of Anticosti. They are generally too small to admit boats, becoming rapid immediately within their entrances, and even the largest of them, Observation river, to the westward of the South-west point of the island, is barred with sand, excepting for short intervals of time after the spring freshets or heavy rains.

FISHERIES and EXPORTS.—Many of the above streams abound with trout, and are visited periodically by great numbers of salmon, which are taken by the 2 or 3 resident families, and salted for the Quebec market.

Seals frequent the flat limestone reefs, and are killed annually in great numbers for their skins and oil.

Codfish are taken occasionally off several parts of the coast in small schooners from the Magdalen islands, and other parts of the Gulf. Their crews often join the occupation of wrecker to that of fishermen. The black bears are very numerous, and may frequently be seen wandering along the shores. Their skins, together with a few of the other animals named, salted salmon, seal skins, and seal oil, are the only exports, and are taken to Quebec, together with occasional cargoes of goods and people saved from wrecks in M. Gamache's schooner, the only vessel belonging to the island. Wild geese, outards, and ducks of various species are abundant, and breed upon the island.

LIGHTS.—Three lighthouses are erected on Anticosti, one on Heath point, at the east end of the island; another on South-west point; and the third on West point.

The lighthouse on the extremity of South-west point is built of

a beautiful grayish-white encrinital limestone, quarried on the spot. The tower, which is 75 feet high and of the usual conical form, exhibits a *white* light, which *revolves* every *minute*, and is visible from N.N.W., round west and south, to S.E. by E. The light is elevated 100 feet above the level of high water, and with the eye 10 feet above the sea, it can be seen from a distance of 15 miles; with the eye 50 feet, it can be seen about 19½ miles; and with the eye elevated 100 feet, it will be visible about 23 miles, in the average state of the refraction. Hence, by ascending the rigging till the light just shows above the horizon, and then measuring the height of the eye above the sea, a very near estimate of the vessel's distance at night may be obtained.

The lighthouse on the southern extremity of Heath point is of the same form and colour as the above, is 90 feet high, and also built of the island limestone. It shows at an elevation of 110 feet above the level of high water a *fixed white* light, which in clear weather should be visible from a distance of 15 miles.

The third lighthouse, erected on the West point of Anticosti, is a circular stone tower, faced with white fire brick, and 109 feet in height. It exhibits at 112 feet above high water a *fixed white* light, visible from a distance of 15 miles. It is lighted from the 1st of April to the 15th of December of each year.

PROVISION POSTS.—The people in charge of the lighthouses and provision-posts, and one man at Fox bay, are the only resident inhabitants of Anticosti. The provision posts have been established by the government and legislature of Lower Canada, for the relief of the crews of vessels wrecked upon the island. Vessels are more frequently lost here in the bad weather at the close of the navigable season than at any other times, and their crews would perish from want and the rigours of a Canadian winter, if it were not for this humane provision. The first of these posts is at Ellis bay, the second at the lighthouse at the South-west point, the third at Shallop creek (sometimes called Jupiter river), and the fourth at the lighthouse on Heath point.*

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* There are direction boards erected on the shore, or nailed to trees from which the branches have been cut off, near the beach, and on various parts of the coast. These boards are intended to point out to shipwrecked persons the way to the provision posts, and were placed (as Captain Bayfield found, from Mr. Lambly's remark-book, for he had not seen them all), on the following parts of the shore:—On the West point; at 12 miles south-eastward of Ellis bay; at 30 miles westward of Shallop creek; and at 21 miles eastward of Shallop creek. And there were formerly others on Heath point and the South-west point, which the lighthouses have rendered unnecessary.

The EAST CAPE of Anticosti is a perpendicular cliff of limestone, rising to the height of 100 feet above the sea. The ridge, of which it is the south-eastern termination, trends to the westward inland, and the extremity of the very low land to the southward of it is Heath point, on which is the lighthouse, bearing from the East cape S.W. ¼ S. 3¼ miles. Between the two points is Wreck bay which is dangerous, and affords no anchorage. A reef extends rather more than one-third of a mile to the south-east from East cape.*

HEATH POINT is of limestone, about 10 feet high, with a superstratum of peat, in which there are several ponds of dark bog water. Being so low, this point disappears below the horizon at the distance of a few miles; the lighthouse then appears like a sail off the island, and is extremely useful in marking the extent of the low land to vessels, either from the eastward or westward, as well as in showing its position from the southward, from which direction it cannot be made out at night, being hidden by the high land behind, or to the northward.

HEATH POINT REEF.—The most dangerous reef off this end of Anticosti runs out E.S.E., nearly 2 miles from Heath point, at which distance there are 5 fathoms water. Within that distance the reef is composed of large square blocks of limestone, with irregular soundings, varying from 2 to 5 fathoms. The rocky and irregular soundings from 5 to 7 fathoms extend nearly 3 miles off Heath point, so that vessels should not approach nearer, with the point bearing between N.W. by N. and W. by N. With the East cape bearing N. by W. a vessel will pass just outside of the shallow and irregular soundings in about 20 fathoms water.

ANCHORAGE.—Off Heath point, to the southward and westward, the shoal water does not extend beyond three-quarters of a mile, and farther off on that side there is one of the best open anchorages on the island. The best berth is in 10 fathoms, over a bottom of sand and mud, with the lighthouse bearing E. by N., and Cormorant point nothing to the westward of W.N.W. The vessel will then be 2 miles off shore, and will be sheltered from all winds from W.N.W., round by north, to E. by N.

CORMORANT POINT bears from Heath point W. by N. ¼ N., 6 miles; and the South point of Anticosti bears W.N.W. 16½ miles from Cormorant point. In this distance the coast is low and undulating, with points of low limestone cliffs, and beaches of sand and shingle in the bays, inclosing large ponds or lagoons, into many of which the tide flows, and also small

* *See* Plan of Anticosti Island, East Cape and Bear bay, No. 1,150; scales, *m* = 0·5 of an inch.

streams from the interior of the island. This part of the coast may safely be approached by the lead, for the reefs nowhere extend farther off than three-quarters of a mile till we come to the South point.

SOUTH POINT is a cliff of sandy clay, resting upon limestone. It does not exceed 60 feet in height, and there is nothing remarkable in its shape; but there is no other clay cliff near it, and as it is an extreme point, there will be little difficulty in distinguishing it by the trending of the land. Moreover, an open lozenge-shaped beacon, formed by battens on a mast 40 feet high, has recently been placed on it.*

A reef runs out nearly $1\frac{1}{2}$ miles to the southward from South point, and the sea usually breaks upon it. The light on Heath point and Cormorant point in one, bearing E. by S., leads 2 miles to the southward of the reef, but the light will seldom be seen up to the reef, which is distant 22 miles from it. The leading mark will nevertheless be of use to vessels between South point and Cormorant point.

ASPECT of COAST.—From South point to the lighthouse on the South-west point, a distance of 56 miles, there is such a sameness in the character of the coast, that it is very difficult to make out one part from another. The houses, however of Mr. Hamelle, in charge of the provision post at Shallop creek, will be seen 13 miles north-westward of the South point, and at the first limestone cliff to the north-westward of those houses is Pavilion river, 24 miles from South point, where there is a beacon similar to the one on the South point, excepting that there is a batten placed horizontally above the lozenge. In this distance the coast is very low, but it begins to rise at Pavilion river, there being a high ridge close in rear of the coast all the way to the South-west point, and beyond it for some miles. Another beacon, similar to the one at Pavilion river, only that the batten is below instead of above the lozenge, will be seen 4 miles S.S.E. from Salt Lake bay.

SALT LAKE BAY, distant 11 miles south-eastward of South-west point, has fine sandy beaches, enclosing lagoons or ponds, into which the tide flows. Off the centre of this bay, and with its north-west point bearing N. by E. $\frac{1}{2}$ E., distant $1\frac{3}{4}$ miles, there is very indifferent anchorage, in 7 fathoms, over sandy bottom. Vessels should be careful not to anchor farther to the southward and eastward, since there is some foul and rocky ground about a mile in that direction from the position which has just been recommended. There are 7 fathoms rocky bottom marked in the chart on the spot alluded to, and there is probably less water

* *See* Positions of Buoys and Beacons, page 315.

between it and the south-eastern point of the bay, so that no one should attempt to pass between it and the shore.*

CAUTION.—In approaching the coast between the South and South-west points of Anticosti, the soundings, extending 7 miles off shore to the depth of 60 fathoms, will afford some warning as far westward as Pavilion river. In the remaining distance of 32 miles to the South-west point, the reefs do not extend beyond a mile from the shore, but they are very steep, so that there is little warning by the lead. This boldest part of the south coast of the island should therefore be approached very cautiously at night or in foggy weather. When far enough to the westward to see the *revolving* light on the South-west point, care should be taken not to bring it to bear in the least to the westward of N.N.W., as directed in page 35.

The SOUTH-WEST POINT of Anticosti is a low projecting mound of limestone, having a small cove on its north side, which forms it into a peninsula. The land rises gradually, in the rear of this, to the summit of the ridge already mentioned. On the south side of the point there is a beach of limestone gravel on which boats may land, as well as in the cove on the north side, when the wind is off shore and the sea smooth. On the north side of the point, and for several miles along the coast to Observation river, the cliffs are perpendicular and washed by the sea. The lighthouse (page 70) stands on the western extremity of the point, and forms a conspicuous land-mark. A reef extends out from the point, to the West and S.W., not more than half a mile ; and 2 miles off, in the same direction, there are 30 fathoms, over rocky bottom, deepening rapidly to 65 fathoms, with sand and shells, at the distance of 3 miles. At the distance of 6 miles, to the southward and westward of the point, the depth is about 110 fathoms, with mud bottom, and increases to 200 fathoms nearly midway towards the south coast.

Vessels may anchor in the bay on the north side of the point, in 12 or 13 fathoms, over a bottom of sand, gravel, and broken shells, with the extremity of the point bearing S.S.W. ½ W., distant three-quarters of a mile, when the cliffs to the eastward will be at the same distance. The shelter is from N. by E., round easterly, to S. by W., and small vessels may lie closer under the point, but it is a dangerous state to be caught in by westerly winds, which are preceded by a heavy swell. The ground is not to be trusted, and no vessel can be recommended to anchor here unless in case of necessity.

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* *See* Plan of Anticosti Island, S.W. Point and Salt Lake Bay, No. 1,147; scale, m = 0·5 of an inch : and Chart of the Gulf of St. Lawrence, Sheet 4, No. 306 ; scale, m = 0·25 of an inch.

There is no anchorage from South-west point to Ellis bay, but as directions have been already given respecting this part of the western coast in page 35, little remains to be noticed. The reefs of flat limestone extend from it, in most parts fully a mile, and often have 10 or 12 fathoms of water close outside of them; but vessels with the lead going may safely stand in as near as 2 miles, or, which will be safer than an estimated distance, had better tack in 17 fathoms.

OBSERVATION RIVER, 5½ miles northward of the South-west point of Anticosti, is the largest stream on the island, having 5 or 6 feet water in its entrance, after the melting of the snows in the spring of the year, but soon becomes barred with sand by the S.W. gales. It becomes shoal and rapid immediately within, though it has a course from the eastward of many leagues. Its source does not appear to be known to the people of the island. Immediately to the northward of this river there are conspicuous and high sandy cliffs.

ST. MARY CLIFFS, 21 miles from South-west point, are also of sand, less high, and less remarkable, but yet not difficult to distinguish; a wooden beacon of the form of a cross has been erected on them (page 321).

ESCOCIN RIVER, at 7 miles north-westward of the St. Mary cliffs, and 12 miles south-eastward of Ellis bay, is a very small stream at the head of a cove affording shelter to boats, and where there is a hut at which a hunter and fisherman occasionally resides.

ELLIS BAY affords the only tolerably sheltered anchorage in Anticosti. Vessels, if their draught is not too great for a depth of 3 fathoms, may safely lie there during the three finest months of summer, namely June, July, and August, but they should moor with an open hawse to the southward. If of larger draught, and only wishing to remain for a few hours, they may anchor farther out, in 3½ and 4 fathoms, but neither the ground nor the shelter will be found so good as farther up the bay.*

The best berth in Ellis bay is in a line between Cape Henry and the White cliff, bearing W. by S. ¼ S., and E. by N. ¼ N., respectively from each other; Gamache house, N. by E. ¼ E., and Cape Eagle, between S.S.E. ¼ E., and S.S.E. The vessel will then be in 3 fathoms, over muddy bottom, distant about 3 cables from the flats on either side, and about half a mile from those at the head of the bay. The extremities of the reefs, off Capes Henry and Eagle, will bear S.W. ¾ S. and S. ¼ E. respectively, thus leaving 3½ points of the compass open, but in a direc-

* *See* Plan of Ellis Bay, No. 308; scale, m = 3 inches.

tion from which heavy winds are of very rare occurrence, and never last long. Moreover, when they do occur, the sea is much less at the anchorage than might be expected, although very heavy in the entrance between the reefs.

These reefs are of flat limestone, and dry at low water; and as the tides only rise from 4 to 7 feet, the sea always breaks upon them when there is the least swell. The reef off Cape Henry runs out nearly a mile to the southward, and that off Cape Eagle nearly three-quarters of a mile to the westward. The entrance between them is 6 cables wide, from the depth of 3 fathoms to 3 fathoms. Extensive flats proceed from these reefs quite round the bay, and do not entirely dry at low water, excepting in very low spring tides, but there are immense boulder stones upon them which always show. These flats occasion the landing to be very bad, excepting at high water, which is the only time that supplies of good water can be obtained from Gamache river.

DIRECTIONS.—Ellis bay can be easily made out from sea, for Cape Henry is a bluff point, and the land being very low at the head of the bay, occasions the opening t how distinctly. On a nearer approach, Cape Eagle and White cliff on the east side, and the houses near the head of the bay, will be easily recognized, whilst two ridges or hills will be seen far back in the country, and to the northward and eastward. The long line of breakers on either side, and the numerous large stones so far from the shore a-head, will present anything but an agreeable appearance to those who may approach this bay for the first time, but there will be no danger if the following directions be attended to.

In approaching Ellis bay from the westward, with westerly winds, run down along the outside of the reefs off Cape Henry by the lead, and in 10 fathoms water, until the west side of White cliff is in line with the east side of the westernmost of two hills far back in the country, and bearing N.E. ½ N.; then haul up with these marks on, and they will lead into smooth water close under Cape Henry reef, in 3½ fathoms. Continue running in with these marks on till Gamache house bears N. by E. ¼ E., then haul up for it, and anchor in the line between Cape Henry and White cliff, as previously recommended. The lead should be kept going, and the reefs on either side should not be approached nearer than 3 fathoms in any part until the vessel arrives at the anchorage.

In running for the bay from the south-eastward, with an easterly wind, come no nearer to the west point of Cape Eagle reef than the depth of 7 fathoms, until the east side of White cliff comes in line with the east side of the same hill as before; then haul up with this mark on, until the houses bear N. by E., and proceed as above directed. Take notice that

the west side of White cliff is used for the leading mark in westerly winds, and the east side in easterly winds, the intention being to keep the vessel in either case from going too near the lee side of the channel.

TIDES.—It is high water, full and change, in Ellis bay, at 1h. 45m.; ordinary springs rise 7 feet, and neaps 4 feet.

ASPECT of COAST.—On the outside of Cape Henry, and continuing to the West point of Anticosti, reefs extend 1¼ miles from the shore, and vessels approaching it should keep the lead going, and attend to the soundings in the charts.

The West point is low and wooded, with reefs which do not extend beyond a mile from the shore, and vessels may pass it in 15 fathoms water at the distance of 1¾ miles. A circular stone lighthouse, faced with white brick, 109 feet high, stands on this point (page 71).

The north coast of Anticosti, between the West and North points, is low, with reefs of flat limestone, extending one mile from the shore. There are soundings, in moderate depths, for more than a mile out from the reefs. Vessels should not go nearer than 25 fathoms. In the rear of the coast, and about halfway between the West and North points, are the two hills or ridges, mentioned as forming one of the leading marks for Ellis bay.

North point is wooded, of very moderate height, and without any cliff. It is so little remarkable as to be only distinguished by the change which takes place at it in the direction of the coast. High Cliff point, distant 13 miles from North point, is easily recognized, being the only cliff on the island that has a *talus* in front of it, or that has not its base washed by the sea at high water.

From High Cliff point to West cliff, a distance of 26 miles, the coast is low in front, with ridges of considerable elevation a few miles back in the country. This is the most dangerous part of the north coast, for the reefs extend nearly two miles out from high water mark, beginning at some low cliffs 7 miles eastward of High Cliff point, and continue to do so for 4 or 5 miles to the south-eastward, after which they gradually diminish in breadth, till at West cliff they are not more than half a mile from the shore. There is more or less warning by the deep sea lead all along this part of the coast until we approach West cliff, off which there are 70 fathoms at the distance of 1½ miles from the surf.

West cliff is very remarkable, for there is no other high cliff near it. It appears like a white patch on the land, and can be seen from a distance

of 6 or 7 leagues. Low cliffs commence 4 miles south-eastward of West cliff, and continue to Carleton point, under which vessels may anchor in fine weather and westerly winds, and obtain wood and water. Ten miles farther to the south-eastward is Cape Observation, a bold, high, and remarkable headland. On its west side there is a magnificent range of grayish white cliffs several hundred feet high. At the extremity of the Cape, these cliffs become suddenly much lower, and then rise again to their former elevation for a short distance on the east side. As this is well described in the chart, the Cape will be easily recognised. Vessels may anchor under it with westerly winds and fine weather, and obtain supplies of wood and water very conveniently. Twelve and a half miles farther south-eastward, along a bold coast with high grayish white cliffs and small bays between, is Bear Head, also of grayish white cliffs, 400 feet high, and resembling in some degree Cape Observation. This last-named cliff has no equally high cliffy headlands to the westward of it, whilst Bear Head has, a difference which will prevent the one from being mistaken for the other.

From the West cliff to Bear Head the coast is extremely bold, there being in most parts a depth of 100 fathoms within 3 miles of the shore.

BEAR BAY, situated between Bear Head and Cape Robert, which are distant nearly 6 miles from each other in a N.N.W. and S.S.E. direction, is by far the best roadstead on the north coast of Anticosti, and, indeed, the only one in which a vessel of large draught would like to anchor, unless she had some particular object in view. It is sufficiently roomy, the bottom is excellent for holding, the depth of water moderate, and the shelter extends from N.N.W., round by west and south, to S.E. by S.

In order to recognise this anchorage, it may be observed that Cape Robert consists of cliffs of the same colour and elevation as those of Bear Head; and that there are two other points of cliffs 300 feet high, within the bay, the south-easternmost of which is named Tower point. The best anchorage is between Tower point and Cape Robert, at a distance of one mile from the former, as well as from the western shore, and in 13 fathoms water over a bottom of brown mud, with Tower point bearing N.W. ¼ W., Cape Robert S.E. ½ S., and Bear Head N. by W. ¼ W.*

Bear bay is divided into three smaller bays by the two high points of cliff already mentioned. In each of these bays there are fine bold beaches of sand and limestone shingle, and streams where water may be easily obtained. But the principal stream is Bear river, which enters the

* *See* Plan of Bear Bay, No. 1,150; scale, m = 1 inch.

southernmost of the three bays, close to the south-east side of Tower point. It is too shallow and rapid to admit boats, but the water is clear and good. The cliffs in Bear bay are magnificent: they are of grayish white limestone, in thin strata dipping very slightly to the southward, and are perpendicular or overhanging. At the extremities of the points the cliffs are rounded by the action of the waves and atmosphere so as to resemble towers, which resemblance is rendered stronger by the masonry-like appearance of the rock. The trees are of diminutive growth.

TABLE HEAD.—From Cape Robert to Table Head, a distance of 19 miles to the south-eastward, the coast is broken into small bays, with shingle beach and small streams between high headlands, terminating in perpendicular cliffs, the bases of which are washed by the sea. None of these bays afford good anchorage. Table Head is rendered remarkable by the hill from whence it derives its name, and which rises immediately from the summit of the cliffs. Fox point is 4 miles farther to the south-eastward, and much lower than Table Head.

FOX BAY, situated a little less than 2 miles to the southward of Fox point, is about a mile wide, and deep, with a sandy beach at its head, where there is a considerable stream issuing from a small lake. Boats may enter the outlet of this lake at high water. The house and store, which at the time of the Admiralty survey were on the north-west side of the head of the bay, were the scenes of the dreadful sufferings and melancholy fate of the crew and passengers of the ship *Granicus*, wrecked on this coast in November 1828, and who all perished from want of food, after enduring the most horrible misery, before the following spring.

Reef point, of very low limestone, is the southern point of Fox bay, from which a reef of flat limestone, covered with only a few feet water, runs out to the distance of fully 1½ miles. There is a depth of 10 fathoms close off the end of this reef, so that it is extremely dangerous. To be sure of clearing it to the north-eastward a vessel should not stand nearer by the lead than 18 or 17 fathoms; or if any of the land to the north-westward of Table Head be open clear of it, she will pass in safety.

From the northern point of Fox bay, which is a cliff of moderate height, another reef runs out more than half a mile to the south-eastward. A point of the southern reef, before mentioned, extends to the northward in such a way as to overlap the reef off the northern point, leaving an entrance into the bay from the north-eastward between the two reefs, only a quarter of a mile wide, and 13 feet in it at low water. Inside, there is a space half a mile wide, from the depth of 2 fathoms to 2 fathoms, and with 16 feet in the middle over muddy bottom. A wind from

E. by N., or E.N.E., blows right into the bay ; but it is said that the sea does not roll in, but in heavy weather breaks on the reefs and in the entrance. This account we believe to be correct, and that small vessels would be quite safe there during the summer months.

Between Fox bay and East Cape the coast is of limestone cliffs 100 feet in height, bold and free from danger. Between Cape Sand-Top and East Cape vessels may anchor with all westerly winds, in from 16 to 20 fathoms, over fine sand, at a distance of one mile from the shore.

TIDES and CURRENTS.—It is high water, full and change, at the East Cape at 1h. 0m. ; ordinary springs rise 5 feet, and neaps 3 feet.

The tides and currents around Anticosti are so irregular, that very little can be added to that which has been already stated in pages 22 and 29.

The stream has run along the land for a whole day at the rate of a knot an hour, in either direction, without any apparent cause, and altogether regardless of the change of tide. At other times the tides have been found regular in shore. Under these circumstances it is evident that the set of the stream, at any time or place, cannot be reckoned upon with certainty. Usually, however, there is very little stream in any direction on the north coast from West cliff south-eastward to Table Head. From the latter to East cape, on the contrary, there is frequently a stream from the northward, running at a rate varying from a half to one knot. In one or two instances this stream has been seen to commence and end with the flood tide, so that there was reason to imagine a connexion between them ; and, if this be the case, it may arise from the circumstance of its being high water sooner on the north coast, up as high as the Esquimaux islands, than at the East point of Anticosti. The waters having thus attained a higher level to the northward may, in consequence, flow to the southward. On the other hand it must be mentioned that this stream was observed at times during the ebb tide.

It frequently happens that, when this current from the northward is running, another from the W.N.W. comes along the south coast, in which case they meet at the reef off Heath point, and cause a great ripple or irregular breaking sea. When this has been observed, there has been usually a fresh breeze along the land on either side of the island ; the wind on the north side of the island being from the North or N. by E., whilst that along the south side was W.N.W. Both these winds were observed blowing a smart double-reefed topsail breeze at the same time, and for a whole day together, and yet never meet round the east end of the island, which is nowhere more than 200 feet in height. Between the two winds there was a triangular space of calm and light baffling airs : the base of this triangle extended from Heath point to East cape, and its

apex from 5 to 8 miles to the eastward of the island. This circumstance is mentioned, because it would be dangerous for a vessel to stand into the calm space between the two winds, where the high cross sea and constantly changing light airs might leave her at the mercy of the current, in no small danger of being set on the Heath point reef.

CHAPTER V.

SOUTH COAST OF THE GULF AND RIVER OF ST. LAWRENCE—CAPE DESPAIR TO GREEN ISLAND.

VARIATION, 25½° to 19° WEST in 1860.

PURSUING the system hitherto followed, of describing the coast from east to west, in the order in which it would be seen by a stranger on a voyage to Canada, we shall commence by describing the south coast of the Gulf and Estuary from the high land of Gaspé; beginning with Cape Despair, at the entrance of Chaleur bay, and leaving all to the southward of a line from thence to the island of St. Paul for a separate part of this book; not only for the sake of a more distinct geographical arrangement and facility of reference, but also because the southern parts of the Gulf are obviously connected with another line of navigation.

In the last Chapter full descriptions were given of the appearance and nature of the coasts, because the information which was conveyed was often new, and because it was necessary to describe clearly those objects which were to be referred to as natural beacons for guiding the mariner clear of the numerous dangers with which those coasts and islands abound. But in this Chapter we shall more freely refer him to the charts for the appearance of the coast so as to avoid swelling these remarks to an inconvenient size. Besides which, the dangers are few and for the most part of small importance.

CAPE DESPAIR, the north-east point of Chaleur bay, consists of red sandstone cliffs, without beach, and of a moderate height above the sea.*

LEANDER SHOAL, lying S.S.E. distant rather more than 1½ miles from Cape Despair, is about a quarter of a mile in diameter, from a depth of 4 fathoms to 4 fathoms, and has 16 feet least water on one spot, which, however, it is very difficult to find. It is a rocky shoal, and there

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* *See* Plan of Gaspé and Mal Bays, and Gaspé Harbour and Basin, No. 1,163; scales { m = 0·8 of an inch. m = 1·3 inches.

is a clear passage between it and the cape. White Head in line with the inner or north-west end of Percé rock, passes just outside of the shoal, in 7 fathoms; therefore the whole of Percé rock, well open to the eastward of the White Head, will lead clear outside of all. From a half to the whole of the Percé rock, shut in behind the White Head, will lead clear between the shoal and Cape Despair.

BONAVENTURE ISLAND has bold and perpendicular cliffs of red sandstone and conglomerate on all sides excepting the west. These cliffs, in some parts, attain an elevation of 250 feet above the sea, and their ledges and fissures are the habitation of innumerable gannets. From the west side, shoal water extends to the distance of a quarter of a mile, and there is anchorage in 15 fathoms between it and White Head; but the riding is insecure and heavy in consequence of the swell, which, in bad weather, rolls round the island. The channel between Bonaventure island and the Percé rock is about $1\frac{1}{3}$ miles wide, and free from danger.

PERCÉ BAY.—The Percé rock is 288 feet high, precipitous all round, and bold to seaward. It is narrow, and about one-third of a mile long in a S.E. direction, being an outlier to the range of cliffs on the south-west side of Mal bay. It is rendered remarkable by two large holes* which have been perforated through it by the waves, and through one of which a boat can pass at high water. Between this rock and White Head is the bay of Percé, having a reef at the distance of half a mile to the south-west of the Percé rock, and extending out nearly half a mile from the shore. Small vessels engaged in the fisheries anchor on either side of this reef, with winds off the land, but it is a dangerous place, and not to be recommended for large vessels.

The town of Percé, principally inhabited by persons engaged in the fisheries, occupies the shores of the bay, and Mont Percé, or, as it is sometimes called, the Table Roulante, rises immediately from it, to the height of 1,230 feet above the sea. This mountain is very remarkable, and can be seen at sea from a distance of 40 miles. A reef connects the Percé rock with Percé point, and off the north-east side of the latter small vessels anchor with westerly winds.

TIDES.—There is generally a regular tide of flood and ebb, of about a knot, between Bonaventure island and the mainland; the flood tide running to the S.W. round Cape Despair and up to the bay of Chaleur; and the ebb in the contrary direction. Two or three miles outside, or to

* In 1845 the roof of the outermost hole fell in.

the eastward of Bonaventure island, the current to the southward out of the St. Lawrence, will often be found running regardless of the tides (page 28).

MAL BAY is between 5 and 6 miles wide, by 4 miles deep, and entirely open to the south-east. On its south-west side, and under the Percé mountains there are magnificent cliffs 666 feet in perpendicular height above the sea. Its north-east side has low cliffs of sandstone, with occasional beaches. A fine broad sandy beach extends across the head of the bay, and incloses a shallow lagoon. A considerable river, and several small streams, discharge their waters into the lagoon, which has an outlet in the north-west corner of the bay, called the Tickle, admitting boats at high water and in fine weather. There is anchorage all round the shores of Mal bay, but as a heavy sea and thick fog often precede a south-east gale and render it difficult for a vessel to beat out, it cannot be recommended. An open cove or small bay is formed on the north-east side, in which a vessel can be occasionally moored close to the shore, and in 3 fathoms water, but this is of no use for the general purposes of navigation.

GASPE BAY.—Peter point, the south point of Gaspé bay, is of low sandstone, and thickly covered with the white houses of the fishermen. Flat island, lying about 4 cables off the point, is small, low, and of sandstone. There is a clear channel between the island and the point, but no good anchorage; for although vessels occasionally anchor to the northward of the island, yet the ground is so foul that there is great danger of losing an anchor from its hooking the rocks. From Flat island to Cape Gaspé, across the mouth of Gaspé bay, the course is N.N.E. and the distance 7¼ miles.

Gaspé bay possesses advantages which may hereafter render it one of the most important places, in a maritime point of view, in these seas. It contains an excellent outer roadstead off Douglas town; a harbour at its head, capable of holding a numerous fleet in perfect safety; and a basin where the largest ships might be hove down and refitted. The course up this bay from Flat island to the end of Sandy-beach point, which forms the harbour, is N. by W. ¼ W. rather more than 16 miles. From the Flower-pot rock off Cape Gaspe to the same point, the course is N.W. ¾ N., and the distance nearly 11½ miles.

Cape Gaspé is an extremely remarkable headland, of limestone, having on its north-east side a magnificent range of cliffs, which rise from the sea to the height of 692 feet. The Flower-pot rock lies close off the south-east extremity of the Cape, and is no longer the remarkable object it was

at the time of the survey of this bay, having since that time yielded to the force of the waves; but it is still always visible, the sea washing over it only at high water. It is sometimes called the "Ship's Head," at others, the "Old Woman," by the fishermen, and is so bold, that vessels may haul round it into Gaspé bay, within the distance of a quarter of a mile. Boats may pass between it and the Cape when there is no surf. The limestone of Cape Gaspé dips to the south-west, so that the cliffs within the bay are very much lower than those on the outside of the Cape previously mentioned.

At Grande Grêve, 3½ miles within Cape Gaspé, the ridge of land dips and narrows, so that there is a portage across it, leading to the settlements at Cape Rozier. On the north-west side of the portage a range of mountains commences, and they continue along the north-east side of Gaspé bay, and the North-west Arm, till they are lost to view in the interior of the country. Opposite to the basin of Gaspé, they rise to the height of 1,500 feet above the sea.

The north-east side of Gaspé bay is thickly covered with the houses of the fishermen, for a distance of 5 miles within Cape Gaspé; the principal fishing establishments belonging, as at Percé, to Jersey merchants. There is an anchorage with good holding ground, but in not less than 17 fathoms, except within a quarter of a mile of the shore, abreast of St. George cove, Grande Grêve, and Little Gaspé. The word cove is, however, inappropriately applied to any part of the shore between Grande Grêve and the Cape, for though there are fishing establishments there are no coves whatever. This side is bold, and free from danger in every part, with the exception of the Seal rocks, which are the only detached danger in the bay.

SEAL ROCKS are 6¾ miles within Cape Gaspé, one mile S.E. by S. from Cape Brulé, and half a mile off shore. The length of this reef, from the depth of 3 fathoms to 3 fathoms, and in a direction parallel to the shore, is half a mile; and its breadth a quarter of a mile. The least water is 4 feet, and there are 3½ fathoms between it and the shore. When on the outer edge of the rocks, Cape Brulé is in one with the next cliffy point up the bay, bearing N.W. by N., and this only mark is sufficient for the safety of vessels beating, for the rocks are out of the way with fair winds.

The south-west shore of Gaspé bay from Peter point to Douglas town, a distance of 12 miles, presents a succession of precipitous headlands, the cliffs of bituminous shale and sandstone rising to the height of 200 feet above the sea. About 5 miles inland the mountains attain an elevation of 1,500 feet, and after sweeping round the head of Mal bay terminate at Percé mountain.

DOUGLAS is a village of fishermen and farmers, standing on the rising ground at the south side of the entrance of the river St. John. The water is very deep in the outer parts of the bay, being from 30 to upwards of 60 fathoms, over mud bottom; but on approaching Douglas the depth decreases regularly to the anchorage.

Cape Haldimand, 2 miles northward of Douglas, is a bluff point of cliff, and the south-eastern termination of the range of hills which separates the harbour, basin, and South-west Arm, from the valley of the river St. John.

Water may be obtained by ascending the river St. John to the islands, a distance of 2 miles. In the spring of the year there is often a depth of 9 feet in the entrance of this river, which is between two points of sand; and there are 12 feet in the narrow channel for some distance within. At the islands the river becomes shallow and rapid.

ANCHORAGE.—The roadstead off the town of Douglas is extensive; vessels may anchor in any part of it, and in any depth from 11 to 6 fathoms, over sand and clay bottom; but the best berth is in 7 fathoms, with the entrance of the river St. John bearing N.W. by W. $1\frac{1}{4}$ miles. The course and distance from Cape Gaspé to this anchorage is N.W. by W., $7\frac{3}{4}$ miles. There is, however, no shelter from winds between S.E. by E. and S.S.E., which blow directly into the bay, and roll in a heavy swell. The riding is, nevertheless, much less heavy on such occasions than might be expected; and, as the ground is excellent for holding, a vessel may safely anchor here during the summer months.

When beating up the bay to this anchorage, observe that shoals extend one third of a mile out from the cliffs on the south-west side of the bay, and that they are too steep for the lead to afford sufficient warning.

GASPE HARBOUR.—From the north-east side of Cape Haldimand, Sandy-beach point runs out to the northward, and forms the harbour of Gaspé. It is a very low and narrow point of sand, convex to seaward, on which side the water deepens gradually from high-water mark to the depth of 3 fathoms, a distance of nearly half a mile; on the inside it is as bold as a wall. Thus this spit, apparently so fragile, becomes a natural dam or breakwater, upon which the heavy swell which often rolls into the bay can produce no effect, expending its strength in the shoal water before reaching the beach. The water deepens immediately outside of 3 fathoms, all along the outside of Sandy-beach point, and also off its north extremity; so that it is both dangerous and difficult to beat in or out of the harbour at night; the lead giving little or no warning.

To the northward of Sandy-beach point, at the distance of nearly a mile, is the Peninsula, which is a low sand, covered with spruce trees, and

it has several whale sheds near its west point. Between the shoal water in the bay to the eastward of the Peninsula, and that which extends from the extremity of Sandy-beach point, is the narrowest part of the entrance to the harbour, which is $4\frac{1}{2}$ cables wide from the depth of 3 fathoms to 3 fathoms, and carries a depth of upwards of 11 fathoms in the centre.

DIRECTIONS.—To run into the harbour of Gaspé attend to the following directions and remarks. On the north-east side of the North-west Arm, there is a wooded point with low clay cliff, $2\frac{3}{4}$ miles above the Peninsula. This point appears as if it were the extreme on that side, when seen over the end of the Peninsula from a vessel approaching the entrance of the harbour, and is called Panard point. Now this point (seen over the Peninsula), in one with the inner or north side of the whale sheds before mentioned, is the mark for the northern extreme of the shoal off Sandy-beach point. The extremity of the spruce trees is as far within the whale sheds as these last are from the sandy extremity of the Peninsula. On the inner side of Sandy-beach point, and near to its junction with the mainland, stands a wooden windmill. Keep Panard point in one with that extremity of the spruce trees on the Peninsula, bearing N.W., until the windmill, just mentioned, comes in one with the west or inner side of the end of Sandy-beach point, bearing S. $\frac{3}{4}$ W., when the vessel may haul into the anchorage under the point, or steer for the basin, as may be desired.

When beating in, tack by the lead from the north-east side of Gaspé bay, and in the board towards Sandy-beach point, put the helm down the instant the marks for leading in, just given, come in one.

At night, when neither Sandy-beach point, nor the Peninsula can be seen, it becomes rather a difficult affair to take a vessel into Gaspé harbour. The only guide then is the lead. There should be a hand in each chains, one heaving when the other cries the soundings. Soundings should be first struck on the north-east side of the bay, about 2 miles outside of the entrance of the harbour, and the edge of the shoal water on that side should be followed, in from 5 to 7 fathoms, until it is judged, by the distance run, and the change which takes place in the direction of the edge of the bank which the vessel is running upon, that she is approaching the Peninsula and has passed Sandy-beach point, and can in consequence venture to haul to the southward into the anchorage. To form this judgment accurately, is the difficult part of the process, and as to fail in this would probably cause the loss of the vessel, if the usual heavy swell should be rolling into the bay with south-east winds, she should rather trust to her anchors off Douglas town than to make the attempt. In case of a vessel which has lost her anchors, the directions which have been given may prove of use. Within Sandy-beach point, that is in the

harbour of Gaspé, the shelter is complete from all winds; the bottom is mud, and the depth nowhere exceeds 11½ fathoms.

GASPÉ BASIN.—Having given directions to enable the seaman to take his vessel into a place of security in Gaspé harbour, from which he may proceed to Gaspé basin, or to any other part of the harbour, with the assistance of the chart, or of a pilot, there is no occasion to swell these remarks by a minute description of the interior of the harbour, which the chart renders unnecessary, and which is not in any way essential to safety. It will only be necessary to add that the harbour is divided into the North-west and South-west Arms. The North-west Arm has deep water for nearly 3 miles above the Peninsula, and continues navigable for keeled boats about 3 miles farther, where the principal river of the harbour enters the arm between Marsh and Meadow islands.

The entrance of the South-west Arm is about 180 fathoms wide, and between two sandy points, but the navigable channel is contracted by shoals on either side to about 60 fathoms; and 30 feet of water can be carried in. The deep water part of the South-west Arm, which continues for three-quarters of a mile within the entrance, is called Gaspé basin; it has a depth of from 5 to 9 fathoms, over a mud bottom, and is sufficiently capacious to hold a great number of vessels as securely as in a dock. Boats can ascend this arm by a narrow channel, between shoals, about 3 miles, as in the North-west Arm, and the navigation, for all but canoes or flat-bottom boats, is terminated in the same manner, by shallow channels between Marsh and Meadow islands; above this part of the river it becomes contracted and rapid, and the water fresh.

A small rivulet in the bay, on the inside of the south point of the entrance of Gaspé basin, is the most convenient watering place in the harbour. The Collector of Customs, and the principal families, reside on the shores of the basin. Most of these families, as well as those of the North-west Arm and the harbour generally, are farmers, but several of them are also engaged in the whale fishery, which they prosecute in small schooners. The cod fishery is carried on by the people of the bay outside, for the most part in connexion with the Jersey merchants. The great majority of the fishermen are either from Jersey, or descended from the people of that island, whose language they retain.

TIDES.—It is high water in Gaspé basin, full and change, at 2h. 40m.; ordinary springs rise 5 feet, and neaps 3; extraordinary springs rise 7 feet. There are regular but weak streams of flood and ebb in the entrances of the harbour and basin. In the bay the streams of the tides are so irregular, that nothing certain can be said respecting them. They are, however,

usually almost imperceptible, excepting near the shores, and even there they are so weak as to be of little or no consequence to a vessel.

CAUTION.—The current down the St. Lawrence runs strongly past Cape Gaspé over towards Flat island, especially during the ebb tide, which often increases its rate to 2 knots, and this should be remembered by vessels making Gaspé bay with a northerly wind. This current, when it meets the swell which so often prevails from the south and south-east, causes a high, short, and breaking sea, all along the coast from above Cape Rozier to Cape Gaspé, and extending across the entrance of Gaspé bay. When the wind is light, a vessel becomes quite unmanageable in this sea, and it is extremely dangerous to be caught in it, close to the shore, by a light breeze on the land.

The soundings off this part of the coast will prove of great use to vessels running up in foggy weather, and had they been known previous to this survey, might have saved many vessels. We will mention one circumstance of a large ship, full of emigrants, which ran stem on to Whale head in Gaspé bay. She was under all sail before a moderate south-east wind, in a thick fog, and steering N.W.; from which it appears that she must have been running in soundings from 20 to 40 fathoms, for at least 12 miles, and, probably, for 3 hours before she struck. No lead was hove, the existence of the soundings being unknown. The vessel was conceived to be well to the northward, and, consequently, to be steering a safe course. One cast of the lead would have dispelled this delusion, and might have saved the vessel. Let this be a warning to seamen.

In the prolongation of the line of Cape Gaspé nearly, there are several rocky patches frequented by the fishermen. They all lie in the same direction from the Flower-pot rock, S.S.E. ½ E. The first is a small patch with 8 fathoms least water, the second has 16 fathoms, and the third 10 fathoms. Their distance from the rock are seven-eighths, 1½, and 13 miles respectively. There is deep water and irregular soundings between them; and the last mentioned is on the banks of soundings which have been already alluded to.

WINDS.—In fine summer weather there is often a sea-breeze blowing right up Gaspé bay from about 9 a.m. until sunset. At such times there is generally a light land-breeze at night down the arms, which often extends for several miles out into the bay. In the outer part of the bay, however, it will generally be found to be calm, even at times when a fresh breeze is blowing outside Cape Gaspé and Point Peter. The wind at sea on such occasions is generally from the south-west.

ASPECT of COAST.—The bold and high coast between Cape Gaspé and Cape Chatte, a distance of 117 miles, will require only a brief notice, as it

is free from danger—with the exception of Serpent reef—and destitute of harbours. The mountains everywhere approach the shore, which is steep and rocky, displaying cliffs, often of great height, and without beach. After heavy rains, waterfalls, which are not to be seen at other times, descend from great heights, and small bays, with sandy beach and rapid streams at their head, occur occasionally; yet these features are not generally so strongly marked as to enable a stranger to make out one part of this coast from another, with facility.

CAUTION.—The long line of coast just described, between Cape Gaspé and Cape Chatte, although so free from danger, is nevertheless to be guarded against in dark foggy nights, since the water is everywhere along it too deep to afford sufficient warning by the lead for the safety of vessels. The shore along its whole extent, excepting in some of the bays, is of highly inclined slate and greywacke rocks, which would cut through a vessel's bottom in a very short time; and such is the impracticable nature of the country, that those who might escape to shore would run great risk of perishing from want before they could reach a settlement.

CAPE ROZIER, which bears N. $\frac{1}{2}$ E. nearly 7 miles from Cape Gaspé, is low, and of greywacke and slate rocks. The shoal water does not extend off it above one-third of a mile, but in the bay to the southward of it, at the distance of $1\frac{3}{4}$ miles, there is a reef which runs out half a mile from the shore. Vessels may find shelter under Cape Rozier from north-west winds, but the ground is not very good, and the easterly swell that frequently rolls in renders it a dangerous anchorage. There are fishing establishments on the cape, and in its vicinity.

LIGHT.—The lighthouse on Cape Rozier is a circular tower of white stone, 112 feet high. It exhibits at an elevation of 136 feet above the level of the sea a *fixed white* light of the first order, which is visible in clear weather from a distance of 16 miles. The light is shown from the 1st of April to the 15th of December of each year.

GRIFFIN COVE and RIVER are $6\frac{1}{2}$ miles N.N.W., nearly, from Cape Rozier. A small bay here affords shelter to the boats of the fishermen, whose houses will be seen around it. There are from 2 to 3 fathoms water in this bay, over sandy bottom.

Supplies.—This bay is of no use to shipping, except to obtain supplies of water, wood, and occasionally, fresh provisions.

GREAT FOX RIVER, at $11\frac{1}{2}$ miles N.N.W. from Cape Rozier, is a mere brook, which enters a small bay about three-quarters of a mile wide,

and half a mile deep. Off each point of the bay there are reefs, which diminish the breadth of the entrance to less than a quarter of a mile, and afford shelter to boats, and to very small schooners, in from 2 to 2½ fathoms, over a bottom of fine dark sand. Round the head of the bay there is a fine sandy beach. Outside the reefs, which extend only a very short distance to seaward, there are 15, 18, and 24 fathoms, over a bottom of sand and broken shells, at the distance of a quarter, half, and one mile respectively.

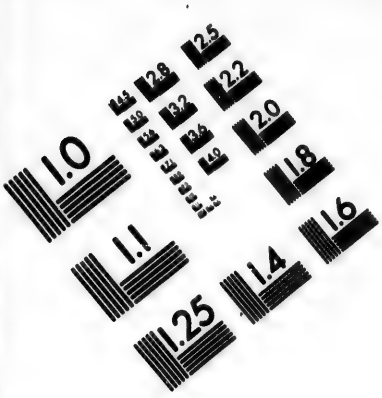
Supplies.—In fine summer weather a vessel might anchor off Great Fox river and obtain water, wood, and supplies of fresh provisions; but it is otherwise of no use to shipping. Seven families of fishermen and farmers resided here in 1829, and had plenty of cattle, sheep, and swine. Since that period their number have greatly increased, and a large stone church has been lately erected.

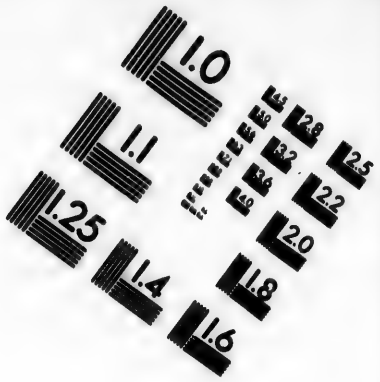
SERPENT REEF, the only danger on this coast, runs out one mile S.E. by E. from Serpent point, its outer extreme, in 3 fathoms, being two thirds of a mile off shore, and N.N.W. 3¾ miles from Great Fox river.

GREAT POND is a small creek which affords shelter only to boats, and will be known by the houses and stages of the fishermen. The creek is 16 miles N.W. ½ N. from Great Fox river, and here as well as in every other cove along this coast to the westward, are seen the neat houses of the Canadian fishermen.

MAGDALEN RIVER, the next place worthy of notice, is 24 miles from Great Pond, in a N.W. ½ W. direction, nearly. The mouth of this river is on the north-west side of a sandy bay, and close under Cape Magdalen, which is rocky, with cliffs of moderate height, and juts out a very short distance from a range of hills which forms the coast line. A reef of rocks which dry in part at low water, extends from Cape Magdalen, about 2 cables to the south-east, parallel to the coast, and shelters the entrance of the river from northerly winds. The river is 30 yards wide at the entrance, with a depth of 7 feet at low water; within, for a very short distance, there are 10 feet over a clean bottom of fine sand. Farther up, the river becomes shallow and rapid, winding its way through a romantic valley between the mountains.

Thirteen feet water can be carried into this river at spring tides, so that it is a considerable stream, and is occasionally visited by schooners from 30 to 80 tons, which warp in when the sea is smooth and the weather fine. The bay is not deep, being merely a gentle curve with a sandy beach for about





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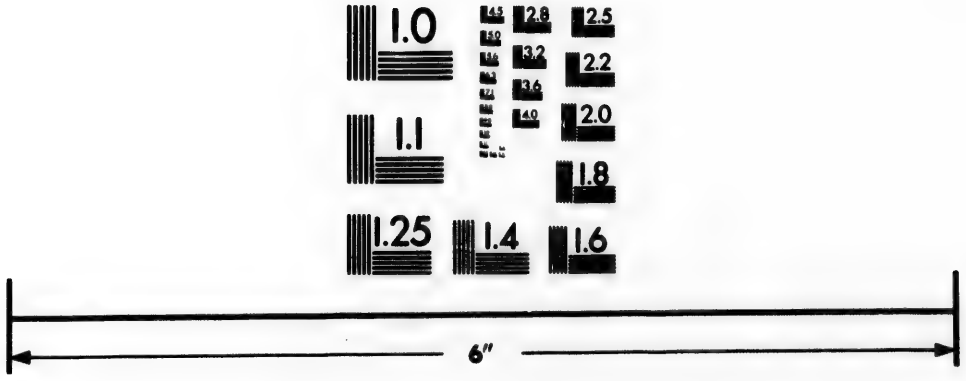

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a mile to the south-east of the river. Vessels may anchor here in 7 fathoms over a bottom of sand, fine gravel, and broken shells, at the distance of three-quarters of a mile from the sandy beach, and from the north-west point bearing W.N.W. The shelter is from W.N.W., round by south, to E.S.E., but it is only a fine weather anchorage, which may be of use to vessels wanting wood and water.

TIDES.—It is high water, full and change, off Magdalen river, at 1h. 15m. Ordinary springs rise from 6 to 8 feet, and neaps from 3 to 4 feet.

During two occasions a regular alternation of the stream of flood and ebb was observed. The flood extended about 1½ miles from the shore, running one knot, and at the line of junction with the almost constant downward current there was a strong ripple.

MONT LOUIS RIVER, 16 miles farther along the coast to the W.N.W., is a much smaller stream than the Magdalen, being 20 yards wide at the entrance, and capable only of admitting a small boat at low water. There are 7 feet in the entrance at high water, and for a short distance within.

The small bay, with sandy beach at its head, into which this river falls, is a mile wide, and nearly three-quarters of a mile deep. Vessels may anchor in it during fine weather, in from 8 to 16 fathoms, mud bottom, nearer the west than the east side. The holding ground is excellent: but since a vessel ought not to be distant more than 3 cables from the west side of the bay, there is not much room to work out, and therefore it would be dangerous for a large vessel to be caught there by a wind on the land. Small vessels, or ships having occasion to stop for a few hours for wood or water, may safely anchor there in fine weather, and will find shelter in all winds, from W.N.W., round southerly, to E.S.E.

Mont Louis river may be thus recognised. In a vessel off this part of the coast, four well marked openings will be seen in the high land in a space of 10 miles. The eastern opening is Grande Matte or Pleureuse river, the next westward is Mont Louis river, and the two others Claude and Pierre rivers. None of them afford good anchorage excepting Mont Louis. On approaching near the shore, an attention to the cliffs, shown in the chart, will point out Mont Louis river beyond a doubt. Several families have settled there and at Magdalen river since 1829.

ST. ANNE MOUNTAINS.—There is nothing worthy of remark for 26 miles farther westward to Cape St. Anne, after which the mountains begin to recede a little from the shore, and to diminish in height. There is, however, another range of mountains in the rear of the coast, called

the St. Anne or Shickshoc mountains, which can be seen from a distance of 80 to 90 miles, under favourable circumstances; and their highest peak, which is about 14 miles behind Cape Chatte, rises 3,970 feet above the sea. These are, therefore, the highest mountains in British North America.

ST. ANNE RIVER, which is 6 miles to the westward of the high Cape of the same name, and 10 miles to the eastward of Cape Chatte, can be entered by small schooners at high water. The entrance is difficult to a stranger. A large rock above water divides it into two very narrow channels, through which a rapid current almost always runs. It flows into the sea through the sandy beach of a bay which affords very indifferent anchorage, the depth of water being too great, excepting at a less distance from the shore than would be considered prudent for any but small vessels. Several families reside here, from whom supplies of provisions can in general be obtained, and also from those at Cape Chatte river.

CHATTE RIVER, $2\frac{3}{4}$ miles eastward of Cape Chatte, enters between large boulders a small sandy bay, affording no anchorage for ships; and admits small schooners with difficulty at high water. The east point of this bay, 2 miles eastward of the river, is a low spit with a reef off it half a mile. Small coasting schooners occasionally anchor under it in westerly winds.

Cape Chatte, when seen from the eastward or westward, so that it appears as the extreme point, can easily be distinguished, being a round hill separated from, but of less height, than the land behind it.*

ASPECT of COAST.—The south coast of the Estuary of the river St. Lawrence, from Cape Chatte to Matan, is straight, bold, and of the same rocks as that which has been just described. Although not a high coast, it is still of considerable elevation above the sea, and the St. Anne mountains continue in the rear of it, at the distance of about 15 miles to their south-western termination, which is 15 miles south of Cape Balance, the last being 25 miles westward of Cape Chatte. Several detached hills will be seen farther to the westward, which are also at a considerable distance from the coast. Two of these have been named the Paps of Matan, though they can with difficulty be made out when bearing S.W.; on any other bearing it is still less easy to distinguish them, but they are of no use except to enable a vessel, obtaining a sight of land, to judge how far she is up the Estuary.

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* *See* Chart:—River St. Lawrence, Part 1, Cape Chatte to Bic Island, with View, No. 309; scale, *m* = 0·25 of an inch.

Capuchin cove, and another cove on the west side of Cape Michaux, afford shelter to boats. There are settlements at Little Matan, a small stream 3 miles eastward of the river Matan.

RIVER MATAN.—The entrance to this fine stream is 33 miles W. ½ S. from Cape Chatte. The river is reported to have its source in a lake of considerable dimensions, distant about 60 miles, following the stream, inland. The depth over the bar is usually 4 feet at low water, and 15 at high water springs. The rise of the tides is, however, very irregular, and although there is often 12 feet at high water neaps, yet there has been seen as little as 10 feet. The depth of water seems to depend so much upon the winds which prevail in the Estuary, that it is impossible to calculate it at any time exactly. Easterly winds were observed to cause high tides, and westerly winds the contrary. The channel is very narrow, and there are several large boulder stones in it, lying on the sand, which diminish the depth 2 feet, and are extremely dangerous when there is any swell. The bar is continually shifting from the effects of gales of wind, so that no directions can be given for sailing in. There are pilots residing here, and no vessel should attempt the entrance without one.

The bar when it was surveyed ran out in a circular form from the east point of entrance, and was met so nearly by another point of sand, running out from the small isolated cliff on the west point of entrance, as to leave only a very narrow channel. The bar dried at low water, and no part of it extended more than 3 cables' lengths outside the entrance of the river. Inside the bar the entrance, between two sandy points, is not more than 60 yards wide, and a rapid current runs out during the ebb tide. There is not room enough for a vessel to lie safely afloat inside, but, nevertheless, considered as a tide harbour, it is a useful place to coasting schooners, which ground at half tide on a good bottom of mud and stones. To a vessel which had lost her anchors, or which had received injury, this river would afford a place of refuge in which she could be safely repaired and refitted. The sandy beach extends about a third of a mile to the eastward of the entrance, and incloses a large space dry at low water, with the exception of the narrow and rapid channel of the river, which is full of stones. The tide ascends about a mile to a rapid over a ledge of rocks, above which the stream is swift, shallow, and navigable for canoes, to the lake above mentioned.

Supplies of provisions can usually be obtained at the Matan river; and it will be easily made out from a vessel, since the entrance shows plainly. The cliffy mound on the west side of the entrance, and the buildings, and large stone church, will also serve to point it out.

Matan is the name of the seignory containing about 500 inhabitants, most of whom live by the combined means of fishing, farming, and piloting. The soil is good, and gives good crops of wheat and other grain, excepting in bad seasons.

ANCHORAGE.—Outside the bar there is anchorage in 5 fathoms half a mile off-shore, and in 10 fathoms a little farther out, the bottom being of sand and clay.

TIDES.—It is high water, full and change, in the Matan river, at 2h. 15m.; ordinary springs rise 11 feet, and neaps 7 feet.

LITTLE METIS BAY, lying 23 miles W. $\frac{3}{4}$ S., nearly, from Matan, is small and divided into two rocky coves, which are open to the eastward, and dry at low water. The coast from Matan to Metis is low, rocky, wooded, unbroken, and may be approached with care by the lead, the bank of soundings becoming gradually wider as we proceed to the westward (page 39).

Little Metis river, a small stream, is at the head of the southern cove. There are several buildings, and a fishing establishment on Metis point, the outer extreme of the bay. A reef, which is bold on the north side, and has some of its rocks always above water, runs out from this point nearly three-quarters of a mile to the eastward, and enables small vessels to remain at anchor, in 3 fathoms, over mud bottom, with the wind as far to the northward as N.W. In this berth vessels lie midway between the eastern end of the reef, and a large Round rock near the shore on the south-east side of the bay. Larger vessels may anchor farther out in 5 or 6 fathoms water, but not in the stream of the reef, where the ground is foul and rocky.

The east end of the reef may be passed by the lead in 4 fathoms, or with the Round rock bearing S.E., but vessels of large draught had better not bring it to bear to the eastward of S.S.E. This rock, which lies about $1\frac{1}{2}$ miles E.S.E. from the reef off the outer point of the bay, will serve to point out Little Metis to a stranger. It cannot be mistaken for Grand Metis with the Admiralty charts, since there is no resemblance in the shapes of the bays. Neither place can be easily made out from a greater distance than 5 or 6 miles, because the points are very low.

GRAND METIS BAY is separated from Little Metis by Metis point. Grand Metis river, a small stream 5 miles westward of Little Metis, is near the west end of the bay, and is nearly dry outside of the very narrow entrance at low water. The bay is rather more than 3 miles wide, and three-quarters of a mile deep; but it is all shoal. Small vessels may

anchor in 3½ or 4 fathoms, under its east point, close to the edge of the shoal water, and in tolerable shelter from winds along the coast, but there is no shelter for shipping. Nevertheless, vessels lie here all the summer months for the purpose of taking in timber. They are usually moored in 6 fathoms, at low water, over mud bottom, and with the river bearing about S.S.W., distant 1½ miles. In this position they are half a mile from the 3 fathoms edge of the shoal water which extends from the shore; and as they are outside of the line joining the points of the bay, they are exposed to the prevailing winds along the coast, and must ride very heavily at times. There is, however, seldom much sea with these winds so close in shore, and the northerly winds seldom blow strong until September. This is a dangerous anchorage after the commencement of that month, but at other times, and in fine weather, vessels may safely anchor anywhere off the bay in from 6 to 12 fathoms; the bottom being everywhere good, and plenty of room to get under weigh.

COCK COVE affords good anchorage for schooners, in 3 fathoms at low water, well sheltered from the winds along the coast. The summit of Mount Camille (page 46) bears from the west point of Cock Cove S.E. by S., 8 miles, and will serve to point out its position to a stranger.

ANCHORAGE.—It may be remarked here, that vessels of large draught may anchor, in fine weather, all along the coast from Metis to Green island.*

FATHER POINT bears from the west point of Grand Metis bay W. by S. 14½ miles. It is low, covered with houses, and the regular rendezvous of the pilots, many of whom reside there.

LIGHT.—A light tower, of octagonal shape and painted white, is erected on the extremity of Father point. It exhibits, at 43 feet above the level of high water, a *fixed red* light, which in clear weather will be visible from a distance of 10 miles, when bearing between W. by S. ¼ S., round south, and E. ½ N. It is lighted from 10th April to 10th December of each year.

RIMOUSKY ROAD.—The eastern point of Barnaby island is 3 miles W. by S. from Father point, and between them is the anchorage or road of Rimousky, where vessels ride throughout the summer to take in cargoes of lumber. They lie moored in 4 or 5 fathoms at low water, with excellent holding ground, and sheltered from W. by N., round by south, to E.N.E. The best sheltered berth is with the eastern point of Barnaby island bearing

* *See* Chart :—River St. Lawrence below Quebec, Sheet 2, No. 312; scale, m = half an inch.

W. by N., Rimousky church S.S.W. ½ W., and Father point E.N.E., in 4 fathoms at low water spring tides over mud bottom. Small vessels can anchor farther to the westward in 3 fathoms at low water, with the east end of the rocks, off the eastern point of Barnaby island, bearing N.W. by W., and distant a quarter of a mile. The reef does not extend above a quarter of a mile off the eastern point of Barnaby island, and may be passed by the lead in 4 fathoms. A landing-pier has recently been built at Rimousky 2,150 feet long, and having at its end a depth of 8½ feet at low water springs.

BARNABY ISLAND is 3½ miles long, and very narrow. It is low, wooded, and uninhabited, and is composed of slate and greywacke rocks, like all the coast and islands on this side of the Estuary. In the interior of the island there is a long pond of fresh, but not good water, which last must be obtained from the Rimousky river.

The channel between the island and Rimousky is dry at low water. From 7 to 12 feet can be carried through it at high water, according as it is neap or spring tide, but at no time should a vessel drawing more than 8 feet attempt this passage, since there are rocks and large stones here and there, and also fish stakes.

The church of Rimousky to the eastward of the river, and many houses, will be seen directly opposite the island.

Off the outside of Barnaby island there is a 3-fathom shoal, extending out fully two-thirds of a mile, and the reef off its western end runs out in the direction of the island more than three-quarters of a mile. Between the western end of the island and the mainland there is a large high and bare rock, which is distant from the island about two-thirds of a mile.

BARNABY ROAD.—Midway between the western points of Barnaby island and Bare rock, bearing North and South from each other, there are 2 fathoms at low water, over muddy bottom, in Barnaby road, which affords good anchorage to small vessels, in all but westerly winds. Rimousky church in one with the eastern end of the rock will lead over the tail of the reef off the west end of Barnaby, and into this anchorage.

OLD BIC HARBOUR, distant 7½ miles to the westward of Barnaby island, dries at low water, and has many rocks in it. Two round and high rocky islets, called the Bicoques, will be seen extending to the westward of its east point, and diminishing the breadth of the entrance to two-thirds of a mile.

Midway between these rocky islets and the west point of the harbour small vessels may anchor in Old Bic road in 3 fathoms at low water, with

a muddy bottom, and with the point bearing West, distant one-third of a mile. To run into this anchorage from the north-west, keep the westernmost of the two rocky islets its own breadth open to the eastward of the west point of the harbour, and this will clear the eastern rock of the Cape Arignole reef, which is the only danger in the way.

ARIGNOLE REEF, distant one mile westward from Old Bic harbour, is composed of two rocks lying across the mouth of the shallow Arignole bay. The western rock is a quarter of a mile long and very narrow; its west end is always above water, and bears from the north-west extremity of Cape Arignole, E. ¼ N. 1¼ miles; but it is distant only a quarter of a mile from the rocks on the eastern side of the cape. The eastern rock is small, covered in high tides, and distant one-third of a mile from the other rock. There are 5 or 6 fathoms water between these rocks, which are very bold to the northward, and vessels might pass between them and the mainland, by keeping close to them, were it ever necessary to try so dangerous a passage.

CAPE ARIGNOLE is distant 10 miles to the westward from Barnaby island, and the summit of the high land of Bic, 1,234 feet above the sea at high water, bears from the north-west extremity of the cape S.W. by S. 2½ miles.

HA HA BAY, on the western side of Cape Arignole, affords excellent anchorage, in easterly winds, off its entrance in 4 fathoms at low water, and farther in for small vessels in 3 fathoms; but it is seldom used, because the equally safe and more roomy anchorage under Bic is justly preferred.

The hills in this neighbourhood are composed of high and narrow ridges of greywacke rocks, parallel to the coast, and to each other, and declining gradually in elevation on either side of the summit of the high land of Bic. When these ridges are seen nearly end on, from either up or down the Estuary, they present an outline so remarkable that this land can be made out from very great distances.

BIC ISLAND lies directly off Cape Arignole, at the distance of nearly 2¼ miles, and is about 3 miles long, without including the reefs, in a direction parallel to the coast, and a mile broad. Its shores are of slate rocks; it is thickly wooded, uninhabited, and its height does not exceed 150 feet above the sea.

Water.—Supplies of water can only be obtained from the bay between the east and south-east points of Bic island, and not always there

in dry seasons. But vessels may supply themselves from the river in the south-east corner of Old Bic harbour, or from a stream on the west side of a small bay of the mainland, 4 miles westward of Cape Arignole.

BICQUETTE ISLAND, lying three-quarters of a mile to the northward of Bic, is half a mile long, a quarter of a mile broad, and about 100 feet high above the sea.

LIGHT.—The lighthouse on the west point of Bicquette island is a conical tower of gray stone, 65 feet high. It shows at an elevation of 112 feet above the level of high water, a *white* light which *revolves* every *two minutes*, and is visible in clear weather from a distance of 17 miles. A gun is fired every hour during fogs and snow storms.

N.W. REEF.—Several large rocks above water extend one-third of a mile to the east and south-east of Bicquette island, and diminish the breadth of the channel between it and Bic to little more than half a mile. Off the west end of Bicquette, in a S.W. by W. $\frac{1}{2}$ W. direction, there are two large rocks always above water, and a third which covers at high water; these lie nearly in a line, and extend to the distance of a mile from the island.

The North-west reef of Bicquette is the greatest danger, lying West $1\frac{1}{4}$ miles from the west end of the island. The cross mark for it is the west end of Bic in one with the north-west point of Ha-Ha bay, bearing S.S.E. $\frac{1}{2}$ E.; but this last-named point can seldom be plainly made out, in consequence of the high land behind it. In approaching the reef from the westward, the north extremity of Cape Arignole should not be shut in behind the west point of Bic.

This reef is composed of two rocks about $1\frac{1}{2}$ cables long, and which just cover at high water: both it and Bicquette are bold to the northward (page 39). There is deep water all along the line from the north side of Bicquette to this reef, and also between the latter and the rocks to the south-east of it, but these are dangerous passages, which ought not to be generally tried, though it is useful to know of their existence in case of emergency.

BICQUETTE CHANNEL.—The same remarks must be applied to Bicquette channel, between Bic and that island: there are no leading marks for running through, but it may easily be done with the assistance of the Admiralty charts in case of necessity. The south-western reef off Bicquette is most in the way, and there are also two small round rocks on the Bic side, 2 cables' lengths off shore, and bearing nearly South from the west end of Bicquette.

To avoid the first of these dangers, do not bring the south extremity of the rocks off the south-east side of Bicquette to bear to the eastward of

E. by N. ½ N.; and if the north side of Bic, near its east end, is not brought to bear to the northward of E. ½ N., the second will be cleared, which, however, always shows, excepting in very high tides. These directions are, however, insufficient without the chart, which must be carefully consulted, for this is an intricate and dangerous place. The best time to run through is at low water, when all the dangers show, and a vessel, keeping in mid-channel between them, will have from 9½ to 5 fathoms, with irregular soundings and foul ground occasionally.

S.E. REEF.—Bic has another set of dangers of its own. The first of these is the South-east reef, which extends out from the south-east point of the island to the distance of nearly 1¾ miles, in an E. by S. direction. The outer part of this reef is formed of three rocks lying in a straight line, and always above water. The two easternmost are the largest, and are nearly joined together, whilst the westernmost of the three is detached, so as to leave a channel through the reef 1½ cables wide, and carrying 5 fathoms water.

Vessels of large draught should not attempt to pass between these rocks, or between them and Bic, for the tides are rendered irregular by the uneven bottom, and there is much foul ground about. Small schooners can pass on either side of the western rock, keeping close to it, if they pass to the westward. The shoal water does not extend beyond a cable's length from the east end of the South-east reef: the rocks above water are bold, both on their north and south sides. The inner part of the reef, extending under water from the south-east point of Bic, reaches farther to the southward than the direction of the rocks, and must be avoided by not bringing the south side of Bic to bear to the southward of W. by S.

N.E. REEF.—The North-east reef is a small patch of black rocks, which shows at low water, lying N.E. by E. 4 cables' lengths from the north-east point of Bic, and N.W. ½ W., rather more than one mile from the east end of the South-east reef. To pass to the eastward of this reef, keep both the rocky islets on the east side of Old Bic harbour open to the eastward of the South-east reef, bearing nothing to the eastward of S.E. by S.

WEST GROUNDS of BIC are an extensive flat of slate, which partly dries at low water. The outer point of these Grounds, in 3 fathoms, bears W. ½ S. from the west point of the island, distant nearly three-quarters of a mile; and they may be approached by the lead, as nearly as the depth of 5 fathoms, at low water.

ALCIDE ROCK, lying S.W. nearly 3¾ miles from the west point of Bic island, has no connexion with that island, but as it is extremely dangerous, and lies much in the way of vessels passing through the Bic

channel, we shall notice it here. It is a small rock, about 6 feet long and 2 feet wide, with 4 feet on it at low water. It rises from a small rocky shoal a cable long, parallel to the coast, and about half as wide, which is so bold all round that there is no warning whatever by the lead. From the north-west extremity of Cape Arignole the rock bears W. ¼ S., distant 5 miles; and it is rather more than 1¾ miles distant from the shore to the southward. There is no close leading mark for clearing it, but vessels will be in no danger from it if Mount Camille be not entirely shut in behind Cape Arignole.

DIRECTIONS.—The above mark, together with the bearings which have been given, will be a sufficient guide to vessels beating through Bic channel in their board to the southward. In their northern board, towards the West Grounds of Bic, the South-east reef must not shut in behind the south side of Bic. All along the south side of Bic, and the South-east reef, they may safely stand in to 7 fathoms at low water, not however, without remembering what has been said respecting the inner part of the latter. Cape Arignole and its reef are quite bold to the northward; and farther to the eastward, between Old Bic harbour and Barnaby island, vessels may safely stand into 4½ fathoms at low tide: the ground is all clean sand and mud bottom, with excellent anchorage in every part.

With this full description of the dangers around Bic and Bicquette, and the assistance of the Admiralty charts, vessels will have no difficulty in passing on either side of these islands in clear weather, for at night the *revolving* light on Bicquette will render it easy to pass to the northward of the island and its reefs. In fogs, the gun fired every hour at the light-house, and the soundings, must be carefully attended to.

ANCHORAGE.—There is excellent anchorage under either end of Bic, and also between it and the main land, according to the wind; and vessels which may be met by an easterly wind, had better anchor than attempt to beat down the Estuary in the long and foggy nights of the fall of the year. More shipwrecks have arisen in consequence of vessels obstinately endeavouring to beat down against an easterly gale, with its accompanying fog, than from any other cause, and yet all they can gain by such a course might be run in a few hours of fair wind.

DIRECTIONS with EASTERLY WINDS.—Being to the north-eastward of Bic, with the first of an easterly gale, bear up before the weather becomes thick, and steer for Bic channel. The South-east reef will be seen, and vessels may pass a quarter of a mile to the southward of it, or by the lead, coming no nearer to it and the south side of Bic than the depth of 7 fathoms at low water. Having run to the westward 1½ miles past the

west end of Bic, haul to the northward, with the lead going, and taking care not to approach the West Grounds nearer than the depth of 6 fathoms at low water, until the south side of Bic bears E. ¼ N., and the north side N.E. by E. ¼ E. With these bearings, anchor in 7 fathoms at low water, over muddy bottom.

In this position a vessel will have the South-east reef shut in behind the south side of Bic; Bicquette, its lighthouse and its rocks, will be all open to the northward of Bic; the North-west reef of Bicquette will bear N. ¾ E., rather more than 1¾ miles; she will be fully half a mile to the westward of the depth of 3 fathoms on the outer extremity of the West Grounds of Bic, and consequently will have plenty of room to weigh with the first of the westerly wind, when she should be cast to the southward, and run through Bic channel to the eastward. A wind from the southward, together with the set of the ebb tide, might perhaps render it preferable to run out to the northward round the North-west reef of Bicquette; in which case do not go to the eastward into less than 8 fathoms at low water, nor shut in the north extremity of Cape Arignole behind the west point of Bic.*

At Night.—If it be night, and yet not so dark but that the principal features of the land can be made out, although it might be dangerous to attempt to make the low South-east reef, another mode of proceeding may be adopted, under the circumstances above contemplated, and supposing the position of the vessel to be known. In that case, run in to the southward, towards the main land, half-way between Barnaby island and Bic, until the soundings shoal to 5 fathoms, at low water; then steer West (*corrected for deviation*), and the water will gradually deepen. When the depth is 9 fathoms the vessel will be past Old Bic, and the opening of that harbour will probably be seen to the southward. When the soundings are 11 or 12 fathoms, she will be past the Arignole reef, and will soon begin to shoal again on the Bic side of the channel. If it be too dark to see the island, go no nearer than the depth of 7 fathoms. When it is judged that the vessel is far enough to the westward, haul gradually to the northward into the stream of the island, and anchor as near the position previously pointed out as can be done. It is not, however, necessary that the vessel should be in that position, although it has been recommended as the best sheltered; for she may anchor, and will ride easily, anywhere under and within 3 miles of the island, in 8, 9, or 10 fathoms at low water; and large and heavy ships would perhaps wish to lie farther off than has been recommended.

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* *See* Chart:—River St. Lawrence, Part 2, No. 310; scale, $m = 0{\cdot}25$ of an inch.

A vessel being to the northward of Bic, and wishing to run to the same anchorage from the north-west, so as to pass to the westward of the North-west reef of Bicquette, should run to the westward, going no nearer to Bicquette and the North-west reef than the depth of 30 fathoms, till the extremity of Cape Arignole comes open to the south-west of Bic, bearing S.E. ¼ E.: then haul to the southward, going no nearer to the reefs of Bicquette than the depth of 8 fathoms and anchor as before directed.

Should the weather be so thick that no land can be seen, either mode of proceeding may be adopted. The latter, however, is to be recommended, as attended with less risk; but in such case, the distance run must be carefully attended to, due allowance made for the tide, and the soundings in the chart consulted. The principal thing is to make sure that the vessel has run far enough to the westward to insure clearing the North-west reef, when she hauls to the southward, for whether she anchors within 1 or 3 miles of Bic, will make no other difference than that the water will be smoother at the less than at the greater distance.

DIRECTIONS with WESTERLY WINDS.—Vessels running down from the westward to anchor under Bic island, should keep Mount Camille open to the northward of Cape Arignole to clear the Alcide rock. Then running along the south side of Bic, and the South-east reef, they should haul round the east point of the latter, no nearer than a quarter of a mile, nor than 8 fathoms, and anchor with the east point of the South-west reef bearing S.W. ¼ S., three-quarters of a mile, in 10 fathoms at low water over clay bottom. The north-east point of Bic will then bear West a little southerly, the north-east point of Bicquette W. by N., and the whole of Cape Arignole will be just open to the southward of the South-east reef.

Large ships may anchor farther off to the eastward, but in the berth recommended, a vessel will have plenty of room to cast to the southward, and weather the South-east reef, in case of a sudden shift of wind. Should she, however, prefer going to the northward round Bicquette, let her beware of the North-east reef of Bic, and also, particularly if the wind be light, of the indraught of the flood tide between Bic and Bicquette.

With NORTHERLY WINDS vessels may anchor anywhere in Bic channel, but the best berth is off a small sandy point, nearly in the middle of the south side of Bic island, in 8½ or 9 fathoms at low water, over muddy bottom, at three quarters of a mile off shore.

TIDES.—It is high-water at Bic island, full and change, at 2h. 15m.; ordinary springs rise 14 feet, and neaps 8½ feet.

To the westward of Bic the first of the flood comes from the north-east but there is but little stream of flood in neap tides between Bic and the main land, excepting close to the latter. In spring tides it runs through the channel at the average rate of 1½ knots, being strongest near the main land. It also runs between Bic and Bicquette, but the stream extends only a very short distance outside the latter island.

The stream of flood continues its course close along the main land, passing inside, and also very close outside, of the Razade, Basque, and Apple islands; but nowhere extending a sufficient distance off shore to be of use to ships beating to the westward much below Green island. That part of the stream of flood which passes farther out towards Bic, and also that which passes between Bic and Bicquette, runs at its full rate only until at half flood, after which it becomes gradually weaker, turning to the north-west, round the west end of the island, and finally to the north and north-east, towards the end of the tide.

The stream of flood becomes weaker, and of less duration, as we proceed to the westward of the islands. Half way between Bic and the Razade islets there is slack water for about an hour at the end of the ebb: after which a weak flood makes during the first quarter of that tide, at the rate of a quarter of a knot; and this is succeeded by the eddy flood at the rate of 1½ knots, or 2½ at the edge of the Bank of Soundings, which comes from the westward, running in the same direction as the ebb during the remainder of the flood tide.

From these remarks it will be seen, that vessels will make little way to the windward against a westerly wind on the Bank of Soundings between Bic and the Razade islets; and indeed all the way to Green island.

The set of the latter part of the flood to the northward past the west end of Bic should be remembered by vessels weighing from the western anchorage, or approaching the island with light winds, especially in the night, or thick weather.

The first of the ebb sets off shore, or from the southward, and this is more particularly remarkable at the eastern anchorage, but it only lasts for a very short time, after which the stream runs fairly between the islands, and along the coast to the eastward, for the remainder of the tide. Its rate, in westerly winds, varies from 2 to 2½ knots, according as it is neap or spring tide, but it does not run so strongly in easterly winds.

BANK of SOUNDINGS.—The chart will show how extensive the south Bank of Soundings is, both to the eastward and westward of Bic and Bicquette, and the assistance which the soundings on it may afford to

vessels at night, or in fogs, will be evident. If vessels on approaching those islands from either direction, will but use their leads in reference to the soundings in the chart, to the bearing of the light, or the gun fired from the lighthouse, and attend to the directions given in page 39, they can scarcely run foul of Bicquette, or its reefs, as has so often occurred in times past. The 30 fathoms edge of the Bank, after passing only 1¼ miles to the northward of the North-west reef of Bicquette, continues to the westward nearly in a straight line; leading 4 miles to the northward of the Razade and Basque islands, 2¼ miles from Apple island, and, be it remembered, to within half a mile of the dangerous Green Island reef (page 106).

There is anchorage on this Bank in 10 or 12 fathoms, with good holding ground, all along the south coast from Bic to Green island.

CAUTION.—The coast of the main land between Bic island and the Razade islets is high and rocky. With the exception of the Alcide rock, noticed in page 100, it is free from danger to small vessels, which may stand close in; but vessels of large draught should not stand in farther than 7 fathoms at low, and 9 fathoms at high water, because of a long ridge of rocky ground, extending 5 miles to the E.N.E. from the north-east Razade islet, with 17 feet least water near its eastern end. To clear every part of this ridge, keep Basque island its own breadth open to the northward of the north-east Razade.

RAZADE ISLETS are two large rocks about a quarter of a mile long; they are low, bare of trees, and bear from each other S.W. ¼ W., 1½ miles. The north-easternmost of these islets bears from the North-west reef of Bicquette S.W. by W., nearly 15 miles, and is distant 1½ miles from the main land to the southward. There is no passage for vessels between them and the shore.

BASQUE ISLAND, lying 5 miles W.S.W. from the north-east Razade islet, is 1½ miles long, parallel to the coast, and 2 cables wide. Its greatest height above the sea does not exceed 100 feet: it is rocky, wooded, uninhabited, and there is no passage for ships between it and the shore, from which it is distant 2 miles.

Near the south-west end of this island a sandy spit runs out a quarter of a mile to the southward. Close off the end of this spit there is a long and narrow hole with 4 or 5 fathoms in it at low water, in which small craft may be secured.

The shoal water extends half a mile to the northward of Basque island, and there is a reef of rocks to the N.W. and West of its western point.

On the western extremity of this reef, and about 6 cables' distant from the island, is a round rock which shows at half tide.

APPLE ISLAND, bearing W. by S. $\frac{3}{4}$ S., $2\frac{3}{4}$ miles from Basque island is formed by one principal and several smaller rocks; the whole covering a space one mile long parallel to the coast, by $1\frac{1}{2}$ cables wide. It is 30 or 40 feet above the sea at high water, without any trees, and distant $2\frac{1}{3}$ miles from the nearest point of main land. There is no passage for ships between it and the shore, but its north side is bold to, there being 4 fathoms at the distance of a cable's length.

GREEN ISLAND, at its eastern end, has a long and narrow point of rocks, always above water, and running out more than half a mile from the trees towards Apple island, which is distant from it $2\frac{3}{4}$ miles in an E.N.E. direction. Half this distance towards Apple island is occupied by reefs of slate which dry at low water. In the remainder, there are a few feet of water, affording a passage for very small schooners, which run in between Green island and the main at high water. And here it may be mentioned that the line of shoal water is continuous from each of these islands to the other, and may be safely approached with care to 7 fathoms at low, or 10 fathoms at high water; as may also the islands.

LIGHT.—A square stone light tower, 40 feet high, and coloured white, stands on the north point of Green island, nearly 2 miles from the eastern extremity of the rocks above water, off its east point, and W. by S. $\frac{1}{2}$ S., $4\frac{3}{4}$ miles, from Apple island. It exhibits, at an elevation of 60 feet above the level of high water, a *fixed white* light, which can be seen in clear weather, and in the ordinary state of the refraction, from the distance of about 12, 14, or 17 miles, according as the height of the observer's eye is elevated 10, 20, or 60 feet. Behind the light-tower, at the distance of about a quarter of a mile, and bearing S.S.E. from it, there is a *white beacon* for leading clear of the tail of the Red Islet reef (page 47).

GREEN ISLAND REEF, which is extremely dangerous, runs out from the lighthouse N.N.E. $\frac{1}{2}$ E., $1\frac{1}{4}$ miles, to the 3 fathoms line of soundings. From its north-east extremity it trends, with a serrated outline, E. by S., till it joins the shoal water connecting Green and Apple islands. Its north-west side is straight, running S.W. by S. from its north-east extremity, to the shore close to the westward of the lighthouse, off which it extends only 2 cables to the north-west. Its shape is therefore irregularly triangular, and the rocks on it dry at low water, nearly three-quarters of a mile out from the high water mark.

On the eastern side this reef may be safely approached to the depth of 7 or even 6 fathoms at low water, but on the north and west sides, there is no bottom with the hand lead until close to it. Half a mile North and West of it, there are between 20 and 30 fathoms water; and at the distance of one mile to the northward of it no bottom with 40 fathoms of line.

Deep as the water is to the northward of this dangerous reef, there is no other guide, in a thick fog when the light cannot be seen, but the soundings: yet it will never do to lose command of the vessel by rounding to, in the rapid ebb tide, (which sets upon the reef at the rate of 5 knots,) for the purpose of getting bottom in the usual way by the common deep sea lead. Here then it is that Massey's patent sounding machine becomes of invaluable service to the seaman, enabling him to obtain correct soundings despite of the rapid tide, and without interfering with the course and rate of his vessel.

To avoid Green Island reef, in the day time and clear weather, keep the summit of the high land to the southward of Cape Arignole (or the high land of Bic) open to the northward of Basque island (page 246).*

ANCHORAGE.—There is excellent anchorage in westerly winds under Green Island reef, and it is the general rendezvous of vessels waiting for the flood, to beat through between Green and Red islands. But as the first of the flood comes from the northward, and sets on the shoals, vessels had better not anchor with the light bearing to the westward of S.W. ½ W., or in less than 7 fathoms at low water. With that depth, on that bearing, they will be 2½ miles from the light, one mile from the eastern edge of the reef, and the same distance from the shoal water to the southward. If they wish still more room, they may choose their berth in 9, 10, or 11 fathoms, and will find a bottom of stiff mud in either depth.†

TIDES.—It is high water, full and change, at Green island at 2h. 45m.; and ordinary springs rise 16 feet, and neaps 9½ feet. When the *Gulnare* was lying at anchor, with the light bearing S.W. by W., and distant 3 miles, and in 8 fathoms at low water, the first of the flood was observed to come from the northward; the vessel then tended gradually round, with her head to the N.E., East, and S.E. at the end of the tide. The vessel continued to go round with the first of the ebb, which came from the southward off the shoals, to the S.W., West, and

* See View A. on Chart, River St. Lawrence, below Quebec, Sheet 2, No. 312.

† For the navigation of the River St. Lawrence above Green island, *see* Chapter 10, page 241.

N.W., which latter point she reached at about 2 hours ebb; and she continued with her head in that direction, from which the tide came, until near the end of the tide. The vessel then began to tend again, with her head to the North and N.E., as before, going completely round the compass in 12 hours. It was never entirely slack water, the stream continuing to run, more or less, during the whole time. The rate of the ebb was 3 knots, and that of the flood 2 knots. This occurred in quite a calm day.

CHAPTER VI.

COAST OF LABRADOR—CAPE ST. LEWIS TO GRAND POINT, INCLUDING THE STRAIT OF BELLE-ISLE.

VARIATION 40° to 36¼° WEST in 1860.

The COAST of LABRADOR from Cape St. Lewis (in lat. 52° 21¼′ N., long. 55° 38½′ W.) to York point, a distance of nearly 30 miles in a south-west direction, is composed of bare granitic hills, which, excepting in the vicinity of Chateau bay, do not exceed the height of 700 feet above the level of the sea; but appear much higher because they usually rise abruptly from that level. Several of the bays and inlets are large, with bold shores and very deep water. Neither the islands nor the dangers of this coast are so numerous as to render the navigation intricate or difficult; so that if it were not for the frequent fogs, the heavy easterly swell rolled in from the Atlantic, and the icebergs, which are almost always drifting along it with the current from the northward, it might be considered a safe coast for vessels.*

FISHERIES.—There are no permanent inhabitants, but the cod fishery is carried on extensively by the people of Newfoundland, who bring their families for the season, and have huts and stages at almost every bay, cove, and harbour. The principal fishing stations are at Battle and St. Charles harbours. The fishery is carried on in small brigs and schooners, generally of from 30 to 100 tons, and in boats. The vessels return to Newfoundland, and only a very few persons are left, who winter up the bays of the main to hunt for furs, and to be ready for the seal fishery at the breaking up of the ice in spring. The boats are hauled up on the rocks, or taken into coves of the main, where they are covered over with spruce branches, and are thus secured from the ice.

The CLIMATE on this coast is extremely severe, the mean temperature of the year being certainly below the freezing point. On the *Gulnares'* arrival at Chateau bay on the 25th of July, the earliest plants were found just springing up, and the grass only just beginning to give a shade of green in the sheltered spots between the hills. The temperature of the sea outside the bay was at 32°, and the air at 43° of Fahrenheit, in the warmest period of the day. The fishermen, however,

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* *See* Chart:—Gulf of St. Lawrence, Sheet 1, No. 1,430; scale, *m* = 0·25 of an inch, corrected to 1860.

reported that it is much more cold about Chateau bay, and the north side of the Atlantic entrance of the Strait of Belle-isle, than it is farther to the northward, and also that fogs are of more frequent occurrence. Our own experience, as far as it goes, confirms the truth of this statement. They say that we must go three or four degrees farther north, to find it equally as cold as it is there. It would seem that this low temperature is common to the entrance of narrow straits, for we not only found the surface of the sea colder there than elsewhere in the neighbourhood, but also at Mingan, Point de Monts, and Bic; and the low temperature of the air obviously depended upon that of the sea; for when we proceeded only a very few miles up the bays, the increase of temperature was felt immediately.

CAPE ST. LEWIS is of precipitous and dark red granitic hills, about 600 feet high. At its southern extremity there is a small rocky peninsula; and nearly a mile to the east of this lies St. Lewis rock, small, low, black, and close to the shore.

ST. LEWIS SOUND, open to the eastward, is more than 4 miles wide at the entrance, between Cape St. Lewis and the North Battle island: the island bearing from the south extremity of the Cape S. by W. ½ W. The sound from its entrance to Telegraph point, at the entrance of St. Lewis inlet, is 8 miles deep in a N.W. by W. direction. Its northern shores are formed by the mainland; and the southern by the Battle, Great Caribou, and several other islands, for about 5 miles in, after which the mainland is on both sides. The shores are almost everywhere quite bold; and the water is everywhere extremely deep, often exceeding 50 or 60 fathoms. Nearly in the centre of the sound are the Middle rocks; and farther in, the River islands.

FOX HARBOUR, 1¾ miles to the north-west of the south extremity of Cape St. Lewis, is a cove of the mainland, running in nearly a mile to E.N.E., and forming quite a secure anchorage in from 5 to 8 fathoms, over mud bottom. The entrance of this harbour is only about a cable wide, but the harbour is more than twice as wide within. Its east point is low, with several houses of the fishermen upon it; and there is a small rock above water close off it to the northward, and joined to it by shoal water.

Water may be had in Fox harbour from runs, and ponds, but wood is extremely scarce.

DIRECTIONS.—No other directions for Fox harbour are necessary than for a vessel to sail in to the northward, close past the point on which the houses stand, and then, leaving an unsheltered bay running to the north on her port hand, haul round the rock above water to the eastward into

the harbour. In order to pass in the deepest water, she should not leave the rock more than half a cable's length on her starboard hand, for there is a reef partly above water off the south-west extreme of the point, which separates the harbour from the unsheltered bay to the westward of it, and forms the north side of the entrance. The best berth to anchor in is about 3 cables' lengths within the entrance.

DEER HARBOUR is formed by Marnham island, which is narrow, of considerable height, and about 1½ miles long. The eastern entrance, between the east end of this island and the main, is narrow, and only fit for boats. The principal entrance, which is 5 miles N.W. of Cape St. Lewis, is between the west end of the island and Deer point, 4 cables wide, with a depth of from 19 to 31 fathoms in the middle, and bold to the rocks on either side. The harbour to the northward of the island is of the same breadth, extensive enough for any number of vessels, and quite landlocked; but the water is inconveniently deep, being generally from 16 to 26 fathoms, and over mud bottom. The course and distance from North Battle island, to the entrance of Deer Harbour, is N. by W. ¼ W. 8 miles.

There are no dangers that cannot be seen either in the entrance or within this harbour, and there is room for the largest ships to beat in or out, so that no particular directions seem necessary. The course in from the sound, between Deer point and Marnham island, is North; and then E.S.E. into the harbour between the island and the main; or N.W., up the cove in that direction, where there is also secure anchorage in a more convenient depth of water than in the harbour, but with less room for large vessels.

Water may be obtained from small runs of water, or ponds of rain water, in various parts near the shores of Deer harbour; and there are a few small trees up the north-west cove, but firewood is scarce.

OPEN BAY is immediately to the south-west of the entrance of Deer harbour; Deer point, which is the west point of entrance of the latter, being also the north point of entrance of the former. The south point of entrance of Open bay is of green felspar, bearing from Deer point S. ¼ W. 1½ miles; and having off it, at the distance of half a mile to the S.E. ½ E., the Black reef above water. Open bay runs in 4½ miles to the north-west, and is about half a mile wide, with deep water. There is good anchorage near its head; but as it is completely open to the wind and sea from the south-east, it is not a safe place for vessels.

DIRECTIONS for St. LEWIS SOUND.—The entrance of the channel, leading to St. Lewis inlet, is between the Black reef just mentioned and the

Seal isles, which are the easternmost of the River islands. This entrance is more than a mile wide, with very deep water, and the course and distance to it from Cape St. Lewis is W. by N. 3¼ miles; or vessels bound to St. Lewis inlet may take their departure from North Battle island, described in page 116. Steering from it N.N.W., a run of 2⅔ miles will bring them to the North Middle rocks, which are two bare rocks close together, and about 40 feet high, Give these rocks a berth of 2 cables' lengths or more, leaving them to the westward or to port, and then continue the same course, N.N.W., for 2 miles or more, when the two Seal isles (small and bare, with shoal water a short distance off their east ends) will be about 4 cables' lengths to the westward.

Alter course now to N.W. by W., and run in through the channel to the northward of the River islands; and between them and the Black reef, Felspar point, &c. This channel is nearly three quarters of a mile wide in the narrowest part, and there is deep water, with nothing in the way excepting two small islets, which will be readily seen, and may be safely passed to the southward at the distance of a cable's length. A run of 3¾ miles on the N.W. by W. course will place the vessel abreast of Telegraph point, which is the south point of entrance of the inlet, and the west side of the channel leading to the southward between the River islands and the main.

St. LEWIS INLET is nearly a mile wide at the entrance, and becomes wider within. There are bays with several small islands in them on the south side of the inlet, but no good anchorage, by reason of the great depth of water, and the exposure to the easterly winds, until we arrive at Black Fly island, which is the first in the centre of the inlet. The course and distance from the entrance of the inlet to this island is N.W. by N. 9 miles. The depth of water often exceeds 30 fathoms in the centre of the inlet, and is nearly 20 fathoms close to the shores on either side. The bottom is everywhere of mud, and there are no dangers in the way excepting a small rocky shoal, 2 miles below the island, which, being always above water, will readily be seen, and must be left on the larboard or port hand in running up the inlet.

Black Fly island is about a third of a mile long, partially wooded, and surrounded with boulder stones, which extend from it 3 cables' lengths down the inlet, and also from the north point of the island across to the main, so as to leave only one navigable channel, which is to the south-westward of the island. There is good anchorage under the west side of this island, in from 5 to 9 fathoms, over a bottom of mud and stones; and wood and water may be had in abundance.

The navigation becomes intricate immediately above this island, but it is nevertheless possible to take a vessel, not drawing over 18 feet, 5¼ miles farther up, where the navigation for vessels is terminated by a flat of sand and boulders, nearly dry at low water, and extending across the inlet off the mouth of the St. Lewis river. A mile below Black Fly island, the inlet is only a third of a mile wide, and it contracts again to the same breadth immediately above the island. Farther up it expands to more than a mile wide, and in this wide space, 1¾ miles above Black Fly island, lies Wood island, which is nearly a mile long and 3 cables broad. This island is also surrounded with boulder stones, leaving a very narrow 2 fathoms channel between it and the main to the south-west, but the channel to the north-eastward of the island is rather wider, and has from 3 to 14 fathoms water in it. This island is thickly wooded, and so are the shores on either side, with spruce and birch which supply timber large enough for building schooners and boats.

The trees increase in quantity and size from the entrance to the head of the inlet, where the climate is quite different from what it is on the coast, where the sea is often at the freezing point, and the temperature of the air not much higher at times, even in the warmest summer months. At the head of the inlet the weather was found inconveniently warm, with westerly winds, and the musquitoes and black flies innumerable. The Newfoundland people obtain the wood necessary for their stages, &c., from this inlet, and sometimes build their shallops and boats there. The scenery is beautiful, the granitic hills rising occasionally, on either side of the inlet, to the height of 700 or 800 feet above the sea. There are high clay cliffs at the mouth of St. Lewis river, at the head of the inlet. There was not water enough for the boats of the *Gulnare* over the flats of sand and boulders at the entrance of this river, and it was not in consequence examined. The water, however, was still quite salt off its mouth, so that it is probably, as the fishermen say, but a small stream. There was a great salmon fishery carried on here several years ago, but it is said to have completely failed.

RIVER ISLANDS are a group lying at the entrance of St. Lewis inlet, and consist of Kalmia island, Pocklington island, and the Seal isles. The former and westernmost is separated from Telegraph point by a deep and clear channel, 4 cables wide; and from Pocklington island, to the eastward, by an unnavigable channel of the same breadth, but full of rocks above water. Both these islands are of bare granite, 150 feet in height, and they are each about 3 miles in circumference. Around, and off the east end of Pocklington island, there are several small and bare islets, the two easternmost of

which are the Seal isles; and there is also a small sunken rock, on which the sea usually breaks, bearing S. by W. from the east end of Pocklington island, and at the distance of a quarter of a mile from its south-east extreme. To the westward of the River islands, and between them and the main, it is possible to anchor, but the depth of water is very great, exceeding 30 fathoms, over mud bottom, excepting very close to the islands; and, as a considerable swell often rolls in at times, the riding is insecure.

FALL HARBOUR, at the head of a bay of the main, one mile deep, is on the south side of Telegraph point, and West about three quarters of a mile from the west side of Kalmia island. It is small, with 3 fathoms water, and only fit for small vessels. Farther out in this bay there is more room, and greater depth of water, but the riding is rendered unsafe by the easterly swell which rolls in at times round the islands.

CUTTER HARBOUR is another bay of the main, $1\frac{1}{2}$ miles deep, with two small islets, and several rocks in it. Only 2 fathoms can be carried in between these islets and the south side of the bay; it is therefore only fit for small vessels. This bay is $1\frac{3}{4}$ miles to the south of Telegraph point, and one mile West from the west end of Pocklington island.

ISTHMUS BAY, about $1\frac{1}{2}$ miles to the southward of Cutter harbour, is exposed to the easterly swell, and consequently of no use to vessels. From this bay the mainland extends to the eastward, forming a high point, called Cape Club, which has a reef off it 70 fathoms to the eastward, and bears S. $\frac{1}{2}$ W. $1\frac{1}{2}$ miles from the east end of Pocklington island. There is no danger in the channel between this cape and Pocklington island, excepting the sunken rock to the southward of the east end of that island, which has been already mentioned.

MIDDLE ROCKS.—Cape Club bears from the North Battle island N.W. $\frac{1}{2}$ W. $4\frac{1}{4}$ miles; and the South Middle rocks (one large rock, with three smaller ones near, and to the south-east of it) lie in the same line of bearing $1\frac{1}{4}$ miles from Cape Club, $2\frac{1}{2}$ miles from the North Battle island, nearly a mile south-west from the North Middle rocks, and North a mile from Cape Surf, the north-west extreme of Great Caribou island. There are clear channels on all sides of, and between the North and South Middle rocks; but they should not be approached nearer than 2 cables' lengths by strangers, excepting in fine weather, when shoals can be seen.

ST. CHARLES RIVER.—Between Cape Club and the Battle islands, the south side of St. Lewis sound is formed by large islands. Muddle island is the most to the north-west of these, and Muddle channel, between

it and the main to the northward, leads into St. Charles river. The entrance to this channel is South 1¼ miles from Cape Club, and the course and distance to it, from the north extreme of the North Battle island, is W.N.W. 3¾ miles. Muddle channel is 2½ cables wide in the narrowest part, and is free from danger, excepting some rocks, which will be seen on the Muddle island side, and which extend nearly a cable's length from the shore, both at the north-east and north-west points of that island. The mainland side should therefore be kept aboard, with a good look out, for the channel has not been very carefully examined. The course and distance through it, from the sound to the mouth of St. Charles river, where there is roomy and landlocked anchorage, is W. by N. 1 mile. Surf island and Size island lie to the south-east and south respectively of Muddle island, and between it and Great and Little Caribou.

MUDDLE HARBOUR, which is between the three first named of those islands, is half a mile long, 360 yards wide, and quite land-locked, with from 4 to 12 fathoms water over mud bottom. There are huts, and stages for fishermen on its shores. This snug little harbour may be approached either from the eastward, or from St. Charles channel; but the entrance on that side is very narrow, and has only 3 fathoms water in it.

DIRECTIONS.—To enter Muddle harbour from St. Lewis sound, steer W. by N. ½ N. from the North Battle island, and a run of 2 miles will lead to Surf cape, the north-west extreme of Great Caribou. Haul round this bold headland to the south-west, as close as is requisite, and steer from it S.W. by W. a mile, when the vessel will be in the Narrows of Caribou channel, which are there only 2 cables wide, between the south-east end of Surf island and the west extreme of Great Caribou. Alter course now to the north-west, so as to pass between Surf island and Size island, keeping at first nearer to the former than the latter, and afterwards in mid channel. A run of about two-thirds of a mile on this course will place the vessel in the entrance of the harbour, and she may haul in to the westward and anchor anywhere.

On arriving in the Narrows of Caribou channel, should the wind be unfavourable for proceeding to Muddle harbour, or should it be preferred, a vessel may haul round the west extreme of Great Caribou to the south-east, and anchor between it and Little Caribou island in the mouth of Pond bay on the west side of Great Caribou, where she will find 4 or 5 fathoms over sand bottom, and lie quite sheltered from all winds. Water may be had from ponds at this anchorage, but for firewood the boats must be sent up St. Charles river. There is an entrance to Caribou channel

between Size island and Little Caribou, but it has not been particularly examined; and the southern entrance to it, between Great and Little Caribou, is shoal, as not more than 2 fathoms can be carried through; so that both these channels leading in from St. Charles channel are fit only for small vessels.

BATTLE ISLANDS form the south point of St. Lewis sound. The south-east Battle island is the easternmost land on this part of the coast, showing as the extreme both from the south-west and north-east. Although named as one, it is composed of two high islands close together, which lie by themselves, about a mile to the southward of the rest of the islands of the same name; and are about three-quarters of a mile long, by less than half a mile wide. The North Battle island will be readily known, not only from being the northernmost of these islands, but also from its being of high and black precipitous rocks unlike any of the rest. It is nearly round, and about a third of a mile in diameter. Several smaller islands included in the name Battle islands lie between these two, and close off the east end of Great Caribou island, the largest of them being called Signal island.

RIBB REEFS are two ridges of rocks, each about 2 cables in diameter, on which the sea always breaks. They are about half a mile apart, and bear nearly North and South from each other. The southern reef lies N.E. ½ E., three-quarters of a mile from Middle Battle island, and the other East 1½ miles from North Battle island. There are several other sunken rocks between the Ribbs and those islands, so that strangers should not attempt to run through, but to pass outside, or to the eastward of the Ribbs, on their way to and from the sound.

BATTLE HARBOUR, between the Battle islands and the east end of Great Caribou, is only fit for small vessels, being about 60 yards wide in the entrance, about 150 yards wide within, about half a mile long, and with 4 to 6 fathoms water in it, over mud bottom. It is generally crowded with the vessels and boats of the fishermen, which moor to the rocks on either side; and the shores are covered with their houses and stages. There is a good house and store on Signal island, with a high flagstaff which can be readily seen at sea, and from which the island derives its name.

The southern entrance is only fit for boats. Vessels must therefore approach this harbour from the northward, passing to the westward of the North Battle, and the other islands lying between it and Signal island, which will be distinguished by the high flagstaff already mentioned. In running to the southward, close past the North Battle island, two small and round

islets, about half a cable in diameter, will be seen, the southernmost of them being in the entrance of the harbour. These are all that are in the way running in, and they are quite bold, and may be closely passed on either side. They bear South from the west side of the North Battle island, at the distances of about half and three-quarters of a mile respectively. There are two coves, with huts and stages of the fishermen, in Great Caribou, just to the westward of Battle harbour, but these cannot be mistaken for the latter after the description which has been given.

Battle harbour is said to be secure during the summer months; but in the fall of the year, what is termed the undertow by the fishermen, namely, a heavy ground swell, is said to roll in between the islands, damaging the vessels and fish stages, and consequently rendering the harbour unsafe. A very heavy sea at times rolls in from the eastward into St. Lewis sound, even as far up as the entrance of the inlet, round the River islands, and up the bays of the main to the westward of them. Perhaps there is not anything more grand and wildly beautiful than this tremendous swell, which often comes in without wind, rolling slowly but irresistibly in from the sea, as if moved by some unseen power; rearing itself up like a wall of water, as it approaches the craggy sides of the islands, moving on faster and faster as it nears the shores, until at last it bursts with fury over islets 30 feet high, or sends up sheets of foam and spray sparkling in the sun-beams 50 feet up the sides of the precipices. The roar of the surf in a calm night can be compared to nothing less than the falls of Niagara. This high and long rolling sea was, however, far less dangerous to the boats of the *Gulnare*, and impeded them less, than the high short breaking sea of the Gulf. It was an annoyance by preventing a landing, but in other respects it was of use by discovering shoals; for when it was running there was nothing with less than 4 fathoms upon it, which had not a breaker upon it. Boats should, however, be on their guard at such times, for on some of these shoals the sea does not break constantly, but only now and then, when the sea suddenly tops, and bursts in a sheet of foam, which would swamp any boat that might be over the spot at the time.

GREAT CARIBOU is the largest island on this part of the coast, being about 9 miles in circumference. Its south-east side is broken into deep coves, open to seaward; and there are several small islets and rocks along it, but only one that is sunken, called Foam rock, which always shows when there is a sea running, and lies 260 yards outside of a small islet, the next south-west of Middle Battle island. This rock is the only danger in the channel between the South-east Battle island and the Great Caribou.

ST. CHARLES ISLAND.—Cape St. Charles bears S.W. by W., 4½ miles from the Middle Battle island, and it will be readily known by St. Charles hill, which is round, 654 feet above the sea, bears N.W. by W., nearly a mile from the cape, and is the highest land on this part of the coast; also by St. Charles island, which is high, half a mile long, and lies off the cape a long mile to the S.E. by E.

This island has several large rocks close off its inner side, or towards the mainland; the Wall shoal with 3 fathoms water on it lies North half a mile from its northern shore, and must be carefully avoided, as in bad weather it breaks heavily at times. Low island lies outside St. Charles island, 6 cables to the S.E., and is bold of approach; a rock has been reported to lie a mile to the S.S.W. ½ W. of it. The Pye rock, with 3 fathoms on it, which was incorrectly reported to lie off Low island, has been examined and found to lie W.S.W. 4 cables from the south-west point of St. Charles island.

ST. CHARLES HARBOUR is formed by three islands, which lie along the eastern side of Cape St. Charles. The space in which vessels can anchor is about 6 cables long, by about a quarter of a mile wide; and the depth of water from 5 to 12 fathoms, over mud bottom. Some sea rolls in with a south-east wind, on which account it is not considered a very secure harbour for large vessels, except in the finest months of summer. Small vessels might be quite secured by making fast to the rocks between Fishflake island and the main in 9 or 10 feet water. There are houses and stages of the fishermen both on the islands and the main. Fishflake island is the south-easternmost island; and the western entrance to the harbour, between it and the main, is so shallow and narrow, as to be only fit for boats. Blackhill island, the next to the north-west, will be readily distinguished, being high, black, and precipitous, unlike any other near. Between this island and Fishflake island is the entrance to the harbour, a cable wide, and with deep water close to the shores on either side. The channel between Blackhill and Spare island, which is the next to the north-west and the only remaining island, is 2 cables wide, only 2 or 3 fathoms water in it, and rendered intricate by rocks. The channel out of the harbour to the north-west, between Spare island and the main, is narrow, shallow, and only fit for boats.

DIRECTIONS.—To make and enter St. Charles harbour, observe that Fishflake island lies close to the east side of Cape St. Charles, and extends farther out to seaward, so as to appear like the south-east extreme of that cape. The south-east extreme of this island forms the south-west point of entrance to St. Charles channel, and bears E. by S. nearly 1½ miles from the summit of St. Charles hill, and N.W. ½ N. one mile from the

north-east extreme of St. Charles island. Run in for the north-east side of Fishflake island, so as to pass its south-east extreme at the distance of about 1½ cables' lengths, steering N.W. by W., which will lead clear of Wall shoal and through the entrance between Fishflake and Blackhill islands, into the harbour. There is nothing in the way. Three small rocks above water will be seen close off the inner or north-west point of Fishflake, but they are quite bold, as are the shores on either side. The best anchorage is off the mouth of a small bay of the main, in which a wharf and flagstaff, at the principal fishing establishment will be seen. The bearings and distances which have been given, together with the very remarkable Blackhill island, will sufficiently point out the position of this harbour to strangers. It is very easy of access and egress: water may be obtained there from the mainland, and wood from St. Charles bay.

St. CHARLES CHANNEL, between the mainland on the south-west and Great and Little Caribou, Size and Muddle islands on the north-east, is from half to three quarters of a mile wide, with deep water (exceeding 40 fathoms in some places), and no detached shoals. The course and distance up the centre of this fine channel, from its entrance to the Narrows, between White Bear point and Size island, is N.W. ½ N. 3¼ miles. Immediately outside the Narrows, on the mainland side, is White Bear bay, running in 1¼ miles W.N.W., affording no shelter, and full of rocks. Just within the Narrows lies Otter island, small, with rocks and shoal water extending 1¼ cables from its south-east end. There is no channel for ships between it and the main; but to the eastward of it, that is, between it and Size island, the channel is a quarter of a mile wide, and has from 14 to 18 fathoms water in it.

A run of half a mile on a North course will lead through the Narrows, into the channel between Muddle island and the main, which is 6 cables wide, with a depth of more than 20 fathoms in it, and free from all danger, excepting those which extend a cable from the shore on either side of the bay between Size and Muddle islands. The course through this channel to the mouth of St. Charles river is N.N.W. 1½ miles, and a vessel may either run up that bay to the westward, or through Muddle channel, eastward, into St. Lewis sound. Throughout all this extensive and landlocked space there is anchorage, but usually in depths exceeding 20 fathoms, over mud bottom.

St. CHARLES RIVER runs East, and is nearly a mile broad; but about 2 miles from its mouth the channel becomes narrow and intricate, though navigable for vessels for 1½ miles farther; above which point there are only 6 feet water, in a narrow channel with many rocks. Wood and water may be had in plenty up this inlet.

NIGER SOUND runs in 6 miles to the north-west, with deep water, often exceeding 30 fathoms, and free from detached dangers. Its entrance is between Cape St. Charles and the Camp islands, and at the distance of 2½ miles within it will be seen Niger island, high, about 2½ miles in circumference, and nearer to the northern than to the southern side of the sound. Smooth island, very much smaller and lower, lies 3 cables to the southward of Niger island, and has shoal water off it, a cable to the north-west and north. The channel between these islands is unsafe but to the northward and southward of both islands the channels are free from all danger. Good anchorage will be found in Horn bay, at the head of the sound; and also in Islet bay, to the northward of Niger island. Wood and water may be had in abundance. No directions are necessary, since there are no dangers, and the high and steep shores are everywhere quite bold. There are, here and there, rocks off the points, but they all show and are close to the shores.

INNER CAMP ISLAND, nearly round, about 300 feet high, and three quarters of a mile in diameter, lies close off the south-west point of Niger sound, so as to leave only a boat channel (called Chimney Tickle) between, where there are fishing huts and stages; as there are also in a small cove of the main half a mile to the westward, where the anchorage is good, and frequented by many vessels during the fishing season.

OUTER CAMP ISLANDS, nearly 1¼ miles long north-west and south-east, and three quarters of a mile broad, are not quite so high, and are also of bare granite. They are several islands, close together, and there is a small cove on their west side, where small fishing schooners moor to the rocks, with very indifferent shelter from south-west winds. There is excellent shelter for the boats of the fishermen, whose huts and stages will be seen on the shores. The channel between the Outer and Inner Camp islands is 2 cables wide, and free from danger. There are three small islets in the bay next westward of these islands. Off the outermost of these islets there is a rock awash, lying 1⅔ cables to the south-east.

TABLE HEAD, which bears S.W. by W. ½ W. 5 miles from the south-east extreme of the Camp islands, is very remarkable, being an isolated mass of basaltic columns upon sandstone (flat at top, and precipitous all round), the summit of which is 200 feet above the sea. Truck island lies close to the east side of this point, affording no shelter; and White Mica cove, one mile farther to the north-east, is only fit for boats.

St. PETER ISLANDS are a scattered cluster of small and low islets, with many rocks above and under water between them. They are cliffy and black, being for the most part composed of basalt and amygda-

loid. The easternmost of them have been called the Peterel isles, because those birds breed upon them. The shoal water does not extend off any of these islands to seaward beyond the distance of 2 cables' lengths. The easternmost of them lies 1¼ miles to the southward, and the south-westernmost islet of the St. Peter group 3 miles S.W. ½ W. from Table head.

St. PETER BAY is within these islets, and on the west side of Table head. It is completely open to the south-east, but the islets and reefs break off most of the sea. Peter point, its south-west extreme, bears N. by W. ½ W. 2 miles from the south-westernmost St. Peter island. The bay is 2 miles deep, in a N.N.W. direction, and there is anchorage three quarters of a mile from its head, in from 13 to 20 fathoms, sand bottom, but there is not more than 6 or 7 fathoms in the entrance between Peter point and the innermost islet. This entrance is three quarters of a mile wide, but has a Two-fathoms shoal in it, nearly 2 cables' lengths off to the westward of the islet; and there is also a reef off Peter point, 1⅔ cables to the south-east. The passage in between these dangers is about 4 cables wide, and must be approached from the southward, passing to the westward of all the St. Peter islands, and giving them a berth of not less than a quarter of a mile. The anchorage in this bay is however very indifferent, although it may be useful in case of necessity. Both wood and water may be obtained there. The hills at the head of the bay are 700 feet high, and extend from in rear of Peter point westward to Chateau bay.

SANDWICH HEAD.—Chateau point, the south-west extreme of Castle island, bears W. ½ S. 6½ miles, from the south-westernmost St. Peter island. Nearly half way between them is Sandwich head and cove, the latter useful only to boats. Between Sandwich point and Seal point, the east point of Chateau bay, is Bad bay, which is rocky and dangerous, affording no shelter to vessels.

KENNY SHOAL and CASTLE LEDGE are two 3-fathom patches, on which the sea often breaks. The former lies South, and is distant 8 cables from Seal island; Castle ledge lies off the east end of Castle island, at 1½ cables to the southward.

CHATEAU BAY* will be easily recognized from a vessel off the coast by its position with reference to the remarkable Table head, and the St. Peter islands; by the high land in rear of it; and by there being a straight and unbroken coast, free from islands, to the westward of it; but more especially by the two wall-sided and flat-topped hills, composed of

* *See* Plan of Chateau Bay, No. 1,151; scale, m = 2 inches.

basaltic columns, which cap the summits of Castle and Henley islands, and are 200 feet in height above the sea. This bay has within it Henley, Antelope, and Pitts harbours; the two last of which are quite secure, and fit for the largest ships. Castle and Henley islands shelter these harbours from the southward and eastward; as do Whale island and York point from the southward and westward. Castle is the outermost island, and Chateau point, its south-west extreme, forms the extreme point of land on this part of the coast. There is a narrow channel between Castle and Henley islands, and also between the latter and the main, leading into Henley and Antelope harbours from the eastward; but they are only fit for small vessels. The main entrance to Chateau bay is between Chateau and York points, the latter bearing from the former W. by N. $1\frac{3}{4}$ miles. Within this entrance, at the distance of $1\frac{1}{4}$ miles to the northward, lies Whale island in the entrance of Temple bay.

The scenery in Chateau bay is magnificent and beautiful. Pitts hill, on the west side of Pitts harbour, is 586 feet above the sea; and there is another hill, the Beacon hill, to the northward of it, 725 feet high. But the highest land is a ridge in rear of or to the north-west of York point, the summit of which, called the High Beacon, is elevated 959 feet above the sea at high water. York point is quite bold, and so is Chateau point to the westward, but has shoal water half a cable's length off it to the S.E.

TEMPLE BAY runs in between high granitic hills rather more than $4\frac{1}{2}$ miles in a N. by W. direction, with very deep water, and no good anchorage. Nevertheless, small fishing-vessels moor on the west side, just within Temple pass, where, as also on the north-west side of Whale island, there are huts and stages of the fishermen. Temple pass, the southern entrance to Temple bay, is only 160 yards wide and 4 fathoms water in it; it bears N.N.E. $\frac{1}{4}$ E. $1\frac{1}{4}$ miles from York point. The other entrance, called Whale gut, is between Whale island and the point of the main which separates Pitts harbour from Temple bay; it is 2 cables wide, but shoals on either side contract the navigable channel to 100 yards, with a depth of 4 fathoms. With these remarks, we shall dismiss Temple bay, only adding that exactly half way between York point and Temple pass, and about half a cable's length to the eastward of the line from the one to the other, there is a small ledge with 3 fathoms least water.

HENLEY HARBOUR is only fit for small vessels, and is frequented by the fishermen who have their huts and stages there. It is formed by Stage island, which is low, and close to the westward of the basalt columns on Henley island. Vessels may enter this harbour either from the eastward through the narrow channel between Castle and Henley islands; or from the south-westward, along the inner or north-west side of Castle island.

The harbour is only about a quarter of a mile long and a cable wide, and carries a depth of from 4 to 6 fathoms; some swell rolls in with south-west winds. The only navigable entrance to the harbour faces the south, in which direction are the basalt columns of Castle island.

ANTELOPE HARBOUR is on the east side of Chateau bay, to the northward of Henley island, and between the latter and Barrier point, which, with its reef, separates it from Pitts harbour to the northward. The passage leading into both these harbours is between Stage and Henley islands to the eastward, and to the westward Whale and Flat islands; the latter being very small, and nearly joined to the former.

DIRECTIONS.—In running into Antelope harbour, the following are the dangers to be avoided. The shoal water extends 1½ cables off to the westward of Stage island, and a cable off to the eastward of the south-east extreme of Whale and Flat islands. Besides these, there are three small ledges to be avoided, which are extremely dangerous to strangers unless the weather be clear, when they can be plainly seen from the rigging or fore yard of a ship. The First and outermost of these ledges, with 2 fathoms least water, lies exactly in the line from the west extreme of Chateau point to the east extreme of Whale island; and with the south extreme of the Seal islands seen through the narrow channel between Castle and Henley islands bearing E. ½ N. The Second ledge, with 3 fathoms least water, lies in the line from the south extreme of Flat island to the south extreme of the basalt columns on Henley island, and is distant 320 yards from the east side of Flat island. The Third ledge has only 9 feet least water, and lies between the east extreme of Whale island and Black point, which is the north-west extreme of Henley island.

The Black rock lies half a cable's length off Black point, and is small and low, but always above water. There is no passage for vessels between this rock and the point; but the channel to the westward of the rock, and between it and the ledge last mentioned, is 240 yards wide, and has from 6 to 9 fathoms water in it. There is also a channel equally wide, and nearly as deep, between the ledge and the shoal water off the east extreme of Whale island, but the former is the preferable channel, because the Black rock, being quite bold, serves as an excellent guide.

In steering for the harbour, observe that Grenville point, on the north side of Antelope harbour, and about a third of a mile to the south-east of Barrier point, is of steep black rock, like Black point, and these two points in one form the leading mark for running in. Being then between Chateau and York points, bring these points in one, bearing N.E. Then run in upon that leading mark, looking out for the First ledge, and passing half a cable to the westward of it, and about 6 cables from Chateau point.

This course continued half a mile farther, will lead between Flat and Stage islands, and 1¼ cables to the eastward of the Second ledge, off the east side of Flat island.

From this position the Black rock will be easily seen, and a vessel must haul a little to the northward, but not more than will be sufficient to pass close to the westward of it, and then round it to the eastward into the harbour. The best position to anchor in is midway between Grenville point and the northern shore of Henley island, where the harbour is 3 cables' wide, and the depth of water from 11 to 14 fathoms, over mud bottom. The vessel will then be in the line from Grenville point to the basaltic columns, and more than 2 cables distant from the small island in the narrow channel out to the eastward, between Henley island and the main; she should be well moored, for the gusts from the westward, through Whale gut, and also from the south-west, are at times very strong.

PITTS HARBOUR is superior to Antelope harbour, being more roomy, and better sheltered. It is full a mile long, north and south, from Barrier reef to its head, and from half to three quarters of a mile wide. The depth of water is 18 fathoms in the centre, decreasing gradually to 4 fathoms close to the shores on either side. The bottom is of mud.

DIRECTIONS.—Vessels intending to proceed to Pitts harbour should proceed, as before directed, as far as the Black rock; only that they need not pass so close to the rock, but may safely go as much as half a cable's length to the westward of it. As soon as the rock bears East, steer N.W. by N., or keep the south-west extreme of the basaltic columns of Henley island open to the westward of Black point, and it will clear the Barrier reef, leaving it to the eastward. Continue to run with leading mark on until the east extreme of Whale island, and the west extreme of Chateau point, in Castle island, come in one, bearing S. by W. Then steer N. by E., or so as to run up the harbour with the last named leading marks on, and the vessel will clear the shoal water extending about 120 yards off Pitts point, and may anchor anywhere, this fine harbour being capacious enough for a large fleet, and quite sheltered from all winds. Water may be had from a stream at the head of the harbour, and wood is also plentiful.

Under certain circumstances, such as scant westerly wind, it might be desirable to pass between the Third ledge and Whale island, instead of between that ledge and the Black rock. In that case proceed as before until the vessel arrives between Flat and Stage islands, and is abreast of the Second ledge. Then alter course to N. by W., taking care not to approach the east side of Whale island nearer than 1¼ cables, or by the

lead than 4 fathoms. Be also careful not to go too far off to the eastward, for fear of the Third ledge, the position of which has been pointed out. As soon, therefore, as the passage into Temple bay, through Whale gut, begins to open, haul to the westward until the leading marks (east extreme of Whale island, and west extreme of Chateau point, in Castle island) come on, then run into the harbour on these marks as before.

BELLE-ISLE,* lying off the coast just noticed, and directly off the Atlantic entrance of the Strait of Belle-isle, is usually frequented by our own and American fishermen. It is about 9½ miles long in an E.N.E. direction and 3 miles wide, including Lark islet close to its north side. It is composed of a range of hills, bare of trees, and which rise to the height of 700 feet above the sea. These hills are principally of granite, alternating with clay and slate, and their steep sides dip into the sea in every part, excepting at the north-east end of the island, where two low points converge so as to form a narrow creek, named Blackjoke cove, which shelters very small fishing vessels during the finest months of summer. Shelter may also be obtained in Lark harbour, under Lark islet, and in Valley cove at 2¼ miles west of the islet; but none of these coves are considered safe early in the spring, or late in the autumn, because of the heavy swell which rolls into them from the eastward.

The anchorage called Lark harbour, between Lark islet and the island, is only 2 cables wide, with deep water, indifferent holding ground, and much exposed to easterly winds, but it having the advantage of two entrances, vessels are allowed a speedy and safe passage to sea.

Blackjoke cove, at the east end of the island, is not more than 150 feet wide, with 12 feet water. It is formed inside an islet joined to the island at low tide, and will only afford secure shelter to one or two small vessels moored head and stern; but in heavy gales from the eastward, especially at high-water springs, the breaking seas dash with such violence over the ledge of rocks, and make it so unsafe, that the Newfoundland Government granted 300*l.* for the construction of a breakwater, which was completed in the summer of 1858, but it being of insufficient weight and strength, the whole of the material was swept into the cove.

In Valley cove, at 2¼ miles west of Lark islet, vessels may find fair anchorage and shelter during easterly winds. The bottom is sand, and in the line of the points the soundings are 17 fathoms, decreasing gradually to the shore.

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* This island was surveyed by Commander J. Orlebar, R.N., during the year 1859.

The south side of Belle-isle affords no anchorage, and there is hardly a creek where a boat might be saved.

The bottom around the island is, on the north side sand and rock, but on the south always rock. The water is deepest on the south side; at the distance of 2 miles the depth is 60 fathoms, and the same depth, rock, at only 1½ miles from the North-east ledge.

The south-west extreme of Belle-isle bears S.E. ¾ S. 19 miles from York point, and N.E. ¼ N. nearly 14 miles from Cape Bauld, in Quirpon island, at the north-east extreme of Newfoundland. Between Belle-isle and Cape Bauld, the deepest water is 50 fathoms, which is found near the island, but there is a middle bank of rock, sand, and shells of 30 fathoms. In the direction of Cape Norman the soundings are comparatively shoal, from 22 to 30 fathoms, sand and shells. The narrowest part of the channel between Belle-isle and the coast of Labrador, is between Lark islet and the St. Peter islands, which are distant from each other nearly 12 miles; the depth increases gradually from either shore until it reaches 90 fathoms, mud. There is said to be a small rocky bank, with 5 fathoms least water, about 3½ miles N. by E. from the north-east end of Lark islet.

LIGHT.—The lighthouse erected on the south-west point of Belle-isle is a circular stone tower, 62 feet high, faced with white fire brick. It exhibits, at an elevation of 470 feet above the sea, a *fixed white* light of the first order, which is visible in clear weather from a distance of 28 miles. It is lighted from sunset to sunrise from the 1st of April to the 15th of December of each year. A gun is fired from the lighthouse during a fog.*

STRAIT of BELLE-ISLE.—The breadth of the channels on either side of Belle-isle has just been mentioned. The entrance of the Strait of Belle-isle, between York point and Cape Bauld, is 26 miles wide; the latter point bearing from the former S. by E. At Cape Norman, 18 miles to the westward of Cape Bauld, the opposite coast of Labrador is distant only 14 miles; but the narrowest part of the Strait is at Amour point, in Forteau bay, where it is only 9¼ miles wide. The western entrance of the Strait, between Greenly island and Ferolle point, is nearly 21 miles wide; the point bearing from the island S.S.W. The course and distance through

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* Commander Orlebar remarks, "that the height of this light above the sea is a serious defect, for it is often obscured by land-fog, when lower down the horizon is clear. Blackjoke cove being so near the east point of the island is always easy of access, and the point itself being of moderate height and extensive range of view, makes it a far more useful position for a light than the hign south-east point."

the Strait is S. 54° W. (true), or according to the mean variation, West 65 miles.

The Newfoundland side of the Strait is now being surveyed by Commander Orlebar, R.N. Captain Bayfield, R.N., observed at Cape Norman, Green island, and Ferolle point, and the coast has been laid down by his observations. The old survey by Captain Cook, although only exhibiting a rude resemblance of the shores, was so generally faithful in pointing out the position of dangers as to be very useful. It is a low coast of limestone, partially wooded with spruce trees, and having no good anchorages for large ships, unless it be in St. Margaret bay: for the other harbours, such as Old Ferolle, St. Genevieve, &c., are too small, or too narrow and intricate in their entrances, for vessels to run for shelter to in bad weather. There are dangerous ledges off this side of the Strait between Green island and Ferolle, which render it desirable to avoid it at night or in thick weather. The opposite coast is much more free from danger, and besides has several good roadsteads. It is composed of steep granitic shores from York point westward to Cape Diable, where sandstone commences and continues to Grand point, at the western entrance of the Strait, lying on the granite, and occasionally forming magnificent cliffs several hundred feet in height.

The SOUNDINGS in the Strait are not so irregular but that they will afford assistance to a vessel at night, or during the fogs which so frequently prevail. The deepest water is on the Labrador side, as, for instance from York point to Red bay, where, however, it is interrupted by the shallow water off Wreck bay. It is also very deep on that side, from Black bay to Forteau bay inclusive; but the line of deep water is not direct, nor, we believe, continuous through the strait, and it is still more perplexing, that there is as deep water within 2 miles of the dangerous Flower ledge on the Newfoundland side, opposite Forteau bay, as in any part of the Strait. The depth of water varies in different parts from between 60 and 70 to 20 fathoms, and the nature of the bottom is as various as the depths, being sometimes of rock, and at others of sand, broken shells, pieces of coral, or gravel.

TIDES and CURRENTS.—Near the shores on either side of the Strait of Belle-isle there is usually a regular alternation of flood and ebb in fine weather, but it is not constant.

The flood comes from the northward along the coast of Labrador, and also from the south-east, from Cape Bauld to Cape Norman. The latter stream, we have reason to believe, is often turned off to the northward by Cape Norman, and the same thing takes place at Green island, on the Newfoundland side, towards Greenly island on the opposite side of the Strait.

There is moreover, at times, a stream running from the south-west for several days together, along the west coast of Newfoundland. This stream occasionally sets from Ferolle point obliquely across the Strait towards Forteau bay. Sometimes, and especially with north-east winds, the current runs directly in an opposite direction along the west coast of Newfoundland from Ferolle point past Rich point. In short, there is no constancy either in the rate or set of these streams, for the winds and the irregular tides modify the set and rate of the equally irregular currents, in a manner which it is extremely difficult, if not impossible, to calculate upon with any degree of certainty. The prevalent current from the northward comes from between Belle-isle and the coast of Labrador. It is often at the temperature of the *freezing point*, bringing many icebergs into the strait, and frequently carrying them through it many miles up the Gulf (page 22). Some of these bergs ground in deep water, whilst others are continually changing their positions. They are much more numerous in some seasons than in others; 200 bergs and large pieces of ice were counted in the Strait in the month of August in one year, whilst there were not above half-a-dozen to be seen in the same month of the following season.

This current has been observed from the northward and eastward assisted by the north-east wind, running full 2 miles an hour, whilst at other times it was almost insensible. It is even reported that there is sometimes a current in the opposite direction, and this report of the fishermen is very probably correct, especially during the ebb tide, and when south-west winds prevail in the Gulf. At the same time that this current is running to the westward, there is at times a stream of warmer water running out to the eastward on the Newfoundland side, especially during the ebb tide.

NAVIGATION of the STRAIT in FOGS.—From these remarks it will plainly appear that the navigation of this Strait of Belle-isle is attended with great danger in dark or foggy nights, during which no vessel should attempt to run through; for we found that, with all our experience, we could not be sure of the vessel's position within 10 miles under such circumstances. On the approach of a dark or foggy night, therefore, it would be prudent to anchor in some one of the bays on the north side of the Strait, rather than to continue under way. A vessel bound in to the Gulf, and running with an easterly wind, will however find no place fit for that purpose until she arrives at the indifferent anchorage of Black bay, for Red bay cannot be entered by a large vessel with an easterly wind.

Loup bay is the first good anchorage under such circumstances, and there the vessel would be so far advanced in her run through the

Strait that it would not be worth while to stop, since she might easily clear every thing in the remaining short distance. But with a south-west wind, at the approach of night, and appearance of a fog, a vessel bound out through the Strait to the eastward had better stand off and on under easy sail, tacking by her deep-sea lead from the Newfoundland side till morning, if she be not farther to the eastward than Ferolle point. If she be farther advanced, she had better endeavour to make Forteau bay before dark, and anchor there for the night. In light winds or calms, during dark nights or foggy weather it is better to bring up with a stream anchor anywhere in the Strait than to drive about with the tides, without knowing whither, but then a look-out must be kept for drifting icebergs. The lights exhibited on the south-east point of Belle-isle and Amour point, and from which fog-whistles are sounded or a gun fired in fogs and snow storms, now greatly lessen the dangers of the navigation.

Fogs occur with all southerly and easterly winds, and they are frequent likewise with the south-west wind; it is only when the wind is from between the north and west, that clear weather can be safely reckoned upon.

WRECK BAY.—Proceeding westward from York point, along the Labrador side of the Strait, the coast is straight and bold to Wreck bay, which has a small river at its head, affords no shelter, and bears W. ¼ S., 10½ miles from York point.

FIVE-FATHOMS PATCH.—S. by W. 2½ miles from the east point of Wreck bay lies a small patch of rocky ground with 5 fathoms least water. On it the basaltic columns of Henley and Castle islands are just open to the southward of York point; and Barge point, the next extreme to the westward, bears W. ¾ S., distant 6 miles. The bottom can be plainly seen on this patch in fine weather; there is a heavy swell upon it in easterly gales, and frequently a great rippling: icebergs often ground upon it.

BARGE BAY, 4½ miles to the westward of Wreck bay, will be known by a water-fall at its head. It affords no anchorage.

GREENISH BAY, about 5½ miles W. by N. from Barge bay, is about 2 miles wide at entrance, narrower within, and about 2 miles deep in a northerly direction. Small vessels occasionally anchor in it; but the ground is of sand, not very good for holding, and it is open to the wind and sea from the south-east.

OIL ISLET lies about 1½ miles W. by S. from Greenish point, the west point of Greenish bay. It is a small, low, and bare rock about a quarter of a

mile off shore, and its south extreme bears W. ¼ N., 6½ miles from Barge point, the extreme of the land to the eastward.

SUNK LEDGE.—Nearly 1½ miles to the westward of Oil islet, and with its south extreme and Barge point in one, bearing E. ¼ S., lies the Sunk ledge, a small patch of rocks awash at low water, on which the sea usually breaks. The rocks bear S.E. ¼ E., and are distant about 6 cables from Twin island, which lies close to the east point of Red bay.

RED BAY is a beautiful little harbour, and quite sheltered from every wind. It is formed by Saddle island, lying off the entrance of a bay of the main, and about a quarter of a mile N.W. by W. from the Twin island. Saddle island has a hill at each end, about 100 feet high, and is low in the middle. The hills of the main are close to the shore, and to the north-west of the island are of reddish granite, nearly 500 feet in height above the sea. There are also high and partially wooded hills at the head of the bay, but the east point of the latter is of moderate height and bare of trees.*

To the westward of Saddle island, at the distance of three quarters of a mile, is West bay, two-thirds of a mile deep, a third of a mile wide, and with tolerable anchorage in westerly winds, in 10 or 12 fathoms water, over sandy bottom; but it is exposed to easterly winds. The Outer harbour of Red bay is between Saddle island and Harbour isle, at the entrance of the Inner harbour; and the depth is from 6 to 9 fathoms, over mud bottom. The entrance of this harbour from the westward is about a cable wide, and the space to anchor in is 4 cables long, by 2 cables wide. Immediately to the north-east of this anchorage is the entrance to the Inner harbour, which is between Harbour isle and the main to the eastward, and a cable wide; but shoal water on either side diminishes the deep water channel to about half that breadth. The depth that can be carried in is 7 fathoms. Within there is a capacious basin, nearly three-quarters of a mile in diameter, with 16 or 17 fathoms water in it, over muddy bottom, and where any number of vessels might safely winter.

Water.—Three small rivulets enter this basin, where water and wood may be obtained at high water; and there is also a stream at the head of West bay.

DIRECTIONS.—Red bay is easily entered with a leading wind, but nothing larger than a schooner of 150 tons burden can beat in or out. The dangers outside the harbour to be avoided are the Sunk ledge already mentioned, off the Twin island; another small rocky shoal lying about

* *See* Plan of Red Bay, No. 1,136; scale, *m* = 3 inches.

340 yards off the south side of Saddle island; and a rock awash about 140 yards South from Peninsula point. Running for the harbour from the eastward, the first will be avoided by keeping Greenish point just open to the southward of the bare islet to the westward of it, till the west extreme of Saddle island bears N.W. ¾ N. Then steer N.W. ¾ W. for the entrance of the bay between Saddle island and the point of West bay, taking care not to go nearer to the former than a quarter of a mile, or by the lead than 11 or 10 fathoms.

As soon as the west end of Saddle island bears N. by W., haul up for it, and round it to the eastward within 40 yards; but observe that farther in, that is, off the north point of the island, there is a reef running out nearly three quarters of a cable's length to the northward, or towards Harbour island. The channel between this reef and the shoal of large stones connecting Harbour isle with the mainland to the westward of it is only a cable wide. As soon as a vessel is through this entrance she may choose her anchorage, only observing that there is shoal water all along the inner side of Saddle island, and to the distance of 140 yards. A vessel moored here will be quite secure from all winds; but if wishing to go into the Inner harbour, there will be no difficulty in doing so with the Admiralty chart, or if a boat first sent to look at the narrow entrance.

In approaching Red bay from the westward there is nothing in the way, excepting the rock, awash, off the Peninsula point, and which, being so close to the shore, may be easily avoided. There is no entrance, excepting for boats, to the eastward of Saddle island.

CARROL COVE, about 3½ miles W. by S. from Red bay, is very small, with its entrance to the eastward. A fishing-vessel or two are occasionally secured in it, moored to the rocks, and there are huts and stages there.

LITTLE ST. MODEST is the name given to two small, low, and bare islets, a mile apart, and close to the shore at the eastern point of Black bay. They afford no shelter to shipping, but have a dangerous rock off them, awash at low water, and bearing S.E. by S., half a mile from the west extreme of the westernmost isle; and W. ½ S. not quite a mile from the south extreme of the easternmost isle. This rock must be carefully avoided in approaching Black bay from the eastward.

The other and principal St. Modest is a small bare isle close to the west point of Black bay. Within this isle fishing vessels moor to the rocks on either side, but it is useless to ships.

BLACK BAY, at 11 miles to the westward of Red bay, is 3 miles wide across the mouth, from one St. Modest to the other, and about

2 miles deep. There is tolerable anchorage in this bay in 10 fathoms water, over sand bottom, but it is open to the south-east winds, which send in a heavy swell. There is, moreover, a rocky shoal on its west side, with 2 fathoms least water, bearing N.E. nearly one mile from St. Modest isle, and South about half a mile from a small rocky peninsula in the north-west part of the bay. There is a river at the head of Black bay which boats can enter at high water; and there is a fine sandy beach to the westward of it extending to the rocky peninsula just mentioned. The best anchorage is off the centre of this beach.

The granite, which has formed the coast line from York point, ceases to do so at the west point of Black bay, being succeeded by sandstone. The granite, however, is seen occasionally at the water's edge under the sandstone at various points farther westward.

DIABLE and LOUP BAYS.—Diable bay is a small open bay 3 or 4 miles to the westward of Black bay. Loup bay, which is 3 miles farther, will be readily known by the magnificent cliffs of red sandstone at its east point, which are 300 or 400 feet high, and extend 2 or 3 miles to the eastward of it. At the south-west point of Loup bay is Schooner cove, open to the eastward, but where nevertheless fishing vessels ride in 7 fathoms water during the summer months. There is a fishing establishment and several houses at this cove.

Loup bay is $1\frac{1}{3}$ miles wide, and $1\frac{1}{4}$ miles deep, running in to the northward between high table-lands of sandstone, highest on the eastern side, where it terminates in the cliffs before-mentioned. These table-lands are covered with green moss and grass. There is a fine sandy beach, and a river, which small boats can enter at high water, at the head of the bay. Although this bay is quite open to the southward, yet vessels ride here at all times during the summer months, the ground being extremely good. The best anchorage is in the north-east corner of the bay, in 10 fathoms, sand bottom, about a quarter of a mile off shore, and with the entrance of the river bearing N.E.

FORTEAU BAY is about 4 miles to the westward of Loup bay, and separated from it by Amour point, which is of moderate height, and shows as the extreme point of land from the eastward; and will be, moreover, known by the lighthouse recently erected on the point.

This bay is 4 miles wide at entrance between Amour point and Forteau point, and $2\frac{3}{4}$ miles deep, running in to the north between high and green table-lands of sandstone, and having a fine sandy beach at its head, with a considerable and rapid river of the same name, abounding with salmon, and which boats can enter at high water. There is a fine fall of water on the west side of the bay $1\frac{1}{4}$ miles within Forteau point, which

will be readily seen by vessels, and serves to point out the bay to strangers. This bay forms the best roadstead in the strait, and the Jersey vessels employed in the fisheries ride there moored all through the summer. It is quite open to the southward, but the winds from that quarter are never strong, nor of long duration ; and the opposite coast of Newfoundland is distant only 12 miles in that direction from the anchorage. The south-west wind rolls in a heavy ground swell at times, which causes vessels to roll considerably, but brings no strain upon the cables.

Vessels may anchor anywhere in the head of the bay, in from 10 to 13 fathoms over sandy bottom, which holds well ; but the best anchorage is in the north-west side of the bay, opposite the fishing establishments, a third of a mile off shore, and nearly half a mile within a spit of rock, which extends about 240 yards off from the western shore, and must be avoided in going in by not going nearer to the shore than a quarter of a mile, or than the depth of 10 fathoms till it is past. The Jersey-men have large fishing establishments on the west side of this bay. There is also an establishment in the north-east corner of the bay, and also at the entrance of the river.

LIGHT.—The lighthouse erected on Amour point is a circular stone tower 109 feet high, faced with white brick. It exhibits at an elevation of 155 feet above the sea, a *fixed white* light, which in clear weather is visible from a distance of 18 miles. It is lighted from the 1st of April to the 15th December of each year. Signals are made during a fog by a fog whistle. A gun will be fired when the whistle is out of order.

ST. CLAIR BAY, 4 miles W.N.W. of Forteau point, is small, open to the southward, and affords no anchorage. There is a very small and low islet and reef, which together extend about a quarter of a mile to the S.W. from its east point.

BLANC SABLON BAY, at 7 miles to the westward of Forteau point, is where the Jersey-men have a large fishing establishment, and where their vessels lie moored all through the summer in from 6 to 8 fathoms, over sandy bottom. Wood and Greenly islands afford some shelter to this roadstead ; nevertheless it is quite exposed to the westerly winds, which send in a heavy sea, and render it a wild and insecure anchorage, particularly in the fall of the year, when vessels have been driven from their moorings and wrecked there in more than one instance.

This bay is 1¼ miles wide by a mile deep, and there is a projecting point in the centre of the bay on which the principal buildings stand. There is a sandy beach on either side of this point, and in rear of it high table-lands of sandstone. Close to the east side of the

projecting point just mentioned, a reef of rocks runs out 3 cables' lengths from the shore, and there is shoal water all round the bottom of the bay, to the distance of a quarter of a mile from the beach.

GRAND POINT (page 139) at the western entrance of the Strait of Belle-isle, and from which the land trends northward towards Bradore, is $2\frac{3}{4}$ miles to the westward of Blanc Sablon. A dangerous reef of rocks extends $3\frac{1}{2}$ cables to the southward and westward of Grand point; and rocks, above and under water, line the shore for $1\frac{1}{4}$ miles to the eastward of this reef, extending off shore to the distance of a quarter of a mile in some places. Half a mile to the eastward of the point, there is a small and narrow cove called the Gulch by the American fishermen who frequent it. This cove is sheltered by rocks off its mouth, and has 9 feet water when the tide is out. The cove is formed by two low and smooth granite spits running out from under the sandstone, and appearing like sand spits from a distance. It is so narrow that there is not room for even the smallest schooner to turn round in it, hence the vessels must be warped out stern foremost. They lie lashed together, and to the rocks on either side, as alongside a wharf.

WOOD ISLAND—of sandstone, much lower than the main, and covered with moss and coarse grass—lies directly opposite Blanc Sablon. Its north point is about half a mile off shore, and the island is $1\frac{3}{4}$ miles long, north and south, and nearly a mile wide at its south end, which is the broadest. Its south point bears W. by N. nearly $7\frac{1}{2}$ miles from Forteau point. A reef runs off the west side of this island to the distance of about a quarter of a mile, but the shoal water does not, in any other part, extend farther than a cable's length.

GREENLY ISLAND—low, bare of trees, of sandstone, and nearly two-thirds of a mile in diameter—lies $1\frac{1}{3}$ miles to the westward of Wood island, and $1\frac{1}{2}$ miles S. by W. from Grand point. There is a patch of rocks lying about 2 cables off its south point, and the shoal water extends about half that distance to the westward.

There is a clear channel between these islands, and also between them and the main. The fishermen occasionally anchor in 5 fathoms, off the mouth of the cove, on the east side of Greenly island; but the sea rolls round the island with south-west gales, and the ground is loose, and not to be trusted. Neither is the anchorage good under Wood island, although vessels occasionally bring up off the fishing establishments on its east side.

TIDES.—The flood tide and current combined occasionally run very strong round the north point of Wood island; and when this stream

meets the heavy swell from the westward, it causes a high sea, dangerous to boats.

FISHERIES.—Wood island was formerly covered with trees, but they have been all cut down by the fishermen, who now often go to Newfoundland for wood for their stages, &c. There are two large fishing establishments on Wood island, which, together with that at Blanc Sablon, belong to Jersey merchants. They carry on the seal fishery, as well as the principal affair of codfish. Herrings are also taken in their season. The fishing vessels arrive from home in the beginning of June, and are frequently for many days drifting about in the ice before they can get to their stations, sometimes in great peril, and sometimes wrecked. The last vessels remain till October, when the ice begins to form again, and the snow storms are extremely dangerous. Every one returns to Europe in the fall of the year, excepting a man or two at each post to take care of the buildings, and to be in readiness to take seals in the spring. They have numerous dogs, mostly of the Esquimaux breed, crossed with the Newfoundland dog; these draw their sledges with firewood, or when they go over to the main or hunt for bears, deer, foxes, martins, &c. The best idea we can give of the climate is by stating the fact that, in the year 1833, the channel between Wood island and the main was frozen across again, after the winter ice had broken up, on the 28th of June. Packed ice remained till the middle of July, and numerous icebergs all the year.

CHAPTER VII.

GULF OF ST. LAWRENCE, NORTH COAST.—GRAND POINT TO CAPE WHITTLE.

VARIATION 35½° to 32° WEST in 1860.

GENERAL OBSERVATIONS.—Greenly island lies S.S.W. 1½ miles from Grand point, which is on the northern or Labrador side of the entrance of the Gulf of St. Lawrence, through the Strait of Belle-isle. The coast, which will form the subject of this chapter, lies between that island and the Southmakers ledge, near Cape Whittle.*

From the south point of Greenly island to the Southmakers ledge the course is nearly West, and the distance 128 miles. This line, however, could not be safely run upon at night, or in foggy weather, because it would lead too near the Murr rocks and the Black reef, and would pass just within the St. Mary rocks. The safe course to be steered from Greenly island by a vessel bound up the St. Lawrence would be W. by S. ¼ S., which would clear all danger up to the east point of Anticosti, bearing from the South point of Greenly island, S. 52° 30′ W. (true) 218 miles. A vessel so steering would carry soundings out to 60 fathoms, at the distance of 15 miles from Greenly island. She would then find a greater depth, or no soundings, until she had increased her distance to 57 miles from the island, when she would again strike ground in from 30 to 50 fathoms, and continue to find soundings from time to time in various depths, and over mud, sand, and gravel bottom, until she had passed the Southmakers ledge. These soundings are on detached banks, lying parallel to the coast at the distance of several leagues. They are very irregular, and there is in general much deeper water between them and the shore, and also to the southward for a great distance, or until we approach the opposite coast of Newfoundland.

CURRENTS and ICEBERGS.—In navigating along this coast, the current in through the Strait of Belle-isle (page 22) must be taken into consideration, and it should also be remembered, that in addition to the permanent dangers of the coast, wandering icebergs are frequently to be met with. There is a weak stream of flood from the eastward inshore, and among the islands, and an equally weak ebb stream in the contrary direction; but both are much influenced by the winds.

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* *See* Charts:—Gulf of St. Lawrence, Sheets 1 and 2, Nos. 1,430 and 1,431; scales, *m* = 0·25 of an inch.

ASPECT of COAST.—The coast, between Greenly island and Cape Whittle, is exceedingly dangerous at night or in fogs; and even in day-time and fine weather it requires the intimate knowledge of the position of every ledge possessed by the fisherman, or a good chart on a large scale, to navigate along it with safety. The mainland and islands are of granitic rocks, bare of trees excepting in the heads of bays, where small spruce and birch trees are met with occasionally. When not entirely bare, the mainland and islands are covered with moss or scrubby spruce bushes, and there are many ponds of dark bog water frequented by water fowl, and flocks of the Labrador curlew. The mainland is broken into inlets and bays, and fringed with islands, rocks, and ledges, which frequently rise abruptly to within a few feet of the surface, from depths so great as to afford no warning by the lead. In some parts the islands and rocks are so numerous as to form a complete labyrinth, in which nothing but small egging schooners or shallops can find their way. But although the navigation is everywhere more or less intricate, yet here are several harbours fit for large vessels, and which may be safely entered with the assistance of the Admiralty charts and these directions.

In general the mainland does not exceed the height of 500 feet above the level of the sea, and is often very much lower, as are all the islands excepting Great and Little Mecattina. These two high islands, the High Land of Mecattina, 685 feet above the sea, and the Bradore hills, are all very remarkable, and serve to point out to a vessel her position from great distances at sea. The Bradore hills are three contiguous round-backed mountains, situated inland, 4 or 5 miles north-eastward from the head of Bradore bay. The north-west summit is the highest, being 1,264 feet above the sea, and the highest land on this coast.

The CLIMATE is very severe, and the dangers are increased tenfold by the fogs which accompany the prevalent southerly winds. It is probable that the mean temperature of the year does not exceed the freezing point. The ice does not usually leave the coast before June, and young ice begins to form again in the pools and sheltered small bays in September, when frosts are very frequent at night. At midsummer we found only a very few of the earliest plants in flower, the grass had not sprung up, and the moss still retained the brown colour of winter. Large masses of snow still occupied the ravines and hollows, and the shaded northern sides of steep hills.

In the sheltered bays the temperature is much higher, and the fogs less frequent than among the outer islands, whilst, at the distance of 5 or 6 leagues inland, the weather is said to be quite warm in summer, and the country thickly wooded with spruce, juniper, birch, and poplar trees, which

grow in valleys, where the soil is of sandy clay, only the summits of the hills being of bare granite like the coast.

INHABITANTS and PRODUCTIONS.—There are a very few Indians of the Montanes tribe, and a family or two of half-civilized Esquimaux occasionally visit the coast from the northward. There are deer (Caribou), bears, wolves, foxes, martens, otters, beavers, and canadian porcupines in the interior, most of which are hunted for their skins by the few inhabitants of the coast. The Canadian partridge, and the ptarmigan or willow grouse are also plentiful.

The only permanent inhabitants are a few widely scattered families, residing at seal and salmon-fishing, and fur-trading establishments, which are visited periodically by small schooners from Quebec. Seals and salmon are very plentiful. The establishments alluded to are at Bradore, Esquimaux bay, St Augustin harbour, Little Fish harbour, and Etamamu. These are the only places which could be relied on for much assistance by the crews of vessels which might be wrecked upon the coast. There is a family residing on the island between Bonne Esperance and Salmon bay in summer, and in Old Fort bay in winter, which might be added to the list. The remaining two or three families are very poor people, who seem just able to make out an indifferent livelihood by hunting and fishing.

COD-FISHERY.—Cod-fish are abundant on the coast, especially to the eastward of Mistanoque. The fishery for them is not carried on only by resident inhabitants, but by schooners which visit the coast every summer. Intelligent American fishermen stated (in 1834), that the number of vessels employed in the fisheries off this coast was about 300 sail, of the average burden of 75 tons. Their crews amounted to 50 men for every 6 vessels, or 2,500 men in all. Of these, about one-fourth only were British, about one-half were American, and the remainder French vessels. Each vessel took, one with another, about 1,500 quintals of codfish. Since the above period the number of vessels has greatly increased.

EGG TRADE.—From 15 to 23 small schooners or shallops, of about 25 tons, are employed in what is termed the "egging business." The eggs which are most abundant and most prized are those of the murr; but the egg of puffins, gannets, gulls, eider ducks, cormorants, &c. are also collected. Halifax is the principal market for these eggs, but they are also carried to Boston and other ports. One vessel of 25 tons is said to have cleared 200*l.* currency by this egging business in a favourable season.

Situated in a severe and gloomy climate, and producing nothing that can support human life, this is one of the most barren and desolate coasts

in the world. There would be no inducement to visit it if its fisheries did not excite the enterprise, and reward the industry of many hundreds of people. In many parts the scenery is not without beauty, but it is beauty of a wild and dreary character.

BRADORE BAY.—The course and distance across the mouth of Bradore bay, from Grand point to Belles Amours point is N.W. 9 miles with soundings the whole way, in depths not exceeding 27 fathoms. In the north-east part of the bay is Ledges island, not high, of granite, surrounded by small islets, rocks, and ledges, as its name implies, and forming the harbour of Bradore. On the north-west side of the bay, just within Belles Amours point, is Belles Amours harbour. Between these harbours there are straggling rocks and no anchorage, which, together with the heavy sea sent in by the southerly winds, make this bay a very dangerous place. Grand point, the south-east point of the bay, has a reef of rocks off it $3\frac{1}{2}$ cables' lengths to the south and west. The end of the point is low, but immediately in rear of it there rises a precipice having a round knoll upon it, and behind that a still higher precipice, being the south-west extremity of the extensive table lands of sandstone, extending eastward along the northern side of the Strait of Belle isle, and northward to near the head of Bradore bay.*

PEROQUET ISLAND, which is high, of sandstone, and the abode of myriads of puffins, will be seen on the eastern side of Bradore bay, distant $1\frac{1}{2}$ miles to the northward of Grand point; and so also will the houses and flagstaff of Mr. Jones's establishment, which are on the mainland, and $1\frac{3}{4}$ miles farther in on the same side of the bay.

BRADORE HARBOUR.—There is no channel between the Peroquet and the mainland, the entrance of the channel leading to the harbour being between the Peroquet and the rocks off the island of Ledges.

To understand the directions for this safe but intricate harbour, it will be necessary to attend to the following description, referring to the Admiralty plan.

The greatest dangers on the eastern or mainland side are, the Gull rock and Gull ledge, which bear S.W. by W., and are distant $2\frac{3}{4}$ and 5 cables respectively from Jones point on which the houses stand. The rock just covers at high water, and therefore can always be seen, but the ledge has 2 fathoms least water on it, and is, therefore, extremely dangerous. On the western side of this ledge, the western extremes of Peroquet and Greenly islands appear in one, and therefore the latter kept half a point open, and bearing S. $\frac{1}{2}$ W., will clear both the rock and

* *See* Plan of Bradore Bay and Harbour, No. 1,137; scale, $m = 2$ inches.

ledge. The only other dangers on this side are several rocks above water, near the shore, just within the houses, and the shoal-water, which extends 2 cables off shore, and continues to the head of the bay.

The islets which lie in a straight line close along the eastern side of the island of Ledges, and form the western side of the channel, are quite bold. They are distinguished by letters in the Admiralty plan, and the southernmost or outermost of them (*a*), which has a small rock off it a cable's length to the southward, is rather in the way, but although small and low, can always be seen.

Between the third and fourth islets (*c* and *d*) is the very narrow channel, carrying 2 fathoms, that leads into Blubber cove on the east side of the island of Ledges, and which is fit only for small vessels.

Between the islets (*d* and *e*) is the entrance to Bradore harbour, 160 yards wide, and carrying a depth of 7 fathoms. There are two more islets close together (*f*) at a quarter of a mile N. by E. of islet (*e*). There are from 15 to 20 fathoms water between (*e*) and (*f*), and also between the latter and the north point of Ledges island. The harbour, which is between the point last mentioned and the islets (*d*) and (*e*), is quite land-locked, and has a depth of from 4 to 17 fathoms water over muddy bottom; but it is capable of holding only a small number of vessels, the space in which they can anchor being about a quarter of a mile long, by 1½ cables wide. There is, however, plenty of room, and good anchorage for large vessels, farther up the bay to the north-east of islets (*e*) and (*f*), in from 16 to 20 fathoms over muddy bottom; some sea rolls in there with south-west winds, but not enough to endanger a vessel with good anchors and cables.

There is no channel for vessels into Bradore harbour to the northward and westward of Ledges island, on account of the innumerable rocks, although it is possible for small craft to pass through a narrow and very deep channel close along the north-west side of the island. The only navigable channel therefore is that which we have described, and which is nearly a quarter of a mile wide in the narrowest part, and 15 fathoms deep.

This full description will render very brief directions sufficient for entering the harbour, which should not be attempted by a stranger without a leading wind and fine weather.

Water may be obtained at a small stream near the houses, and also from small rivers, in the head of the bay at high water.

DIRECTIONS.—In coming from the eastward give Grand point a berth of a full half mile, or in hauling around it to the northward, take care that the west extreme of the Peroquet does not bear to the westward of North, for the reef is very dangerous, and there is no warning by the lead. The west side of the Peroquet may be passed as near as a quarter

of a mile. Having passed it, haul to the eastward till the mark for clearing the Gull rock and ledge, namely, the western point of Greenly island, open half a point to the westward of Peroquet island, bearing S. ¾ W., comes on. Then steer with that mark on, or N. ¾ E. until the Gull rock is seen or until Jones's house bears E.N.E. and the islet (*e*), which will appear as the north-east extreme of Ledges island, N.E. by N. Steer now for the latter, leaving the Gull rock to the eastward, and looking out for the other small rock on the opposite side, which has been mentioned as lying off islet (*a*). As soon as this rock is passed, the channel will be clear ahead by keeping nearer the islets than the mainland. When opposite Jones's house, bearing S.E. by E., the vessel will also be abreast islet (*b*); a run of about 7 cables' lengths farther along islets (*c*) and (*d*), which are quite bold, will lead to the entrance; and she must haul sharp round to the westward between (*d*) and (*e*), into the harbour, unless the more roomy and deep water anchorage is preferred farther up the bay; in which case there is nothing in the way, excepting the shoal extending off the main shore already mentioned.

In approaching Bradore from the westward, beware of the reefs which extend three quarters of a mile to the south-west from Ledges island. In order to give these a wide berth, do not bring the Peroquet to bear to the southward of S.E. by E. until Jones's house bears N.E. by E.; then steer for the latter, until the marks come on for clearing the Gull rock and ledge, when the vessel must proceed as before directed.

TIDES.—A weak stream of flood sets into Bradore bay from the southward. The ebb sets out in a contrary direction, and is at times accelerated by south-west winds, but its rate never amounted to one knot.

ASPECT of COAST.—The country separating Belles Amours, Middle bay, and Five Leagues harbour is very remarkable. Low granite, on which are ridges of boulders, with coarse grass and moss, extends out to seaward several miles from the range of steep granite hills, 400 or 500 feet feet high, which trend westward from the head of Bradore bay. This low country has a green and alluvial appearance from the sea; and it is not until we approach near to it, that we perceive that the shores are of rock and boulders.

Belles Amours point will be easily recognized, being a mound of bare granite, 60 or 70 feet high, at the south-east extremity of the low peninsula, separating the harbour of the same name from Middle bay.

BELLES AMOURS HARBOUR.—Stony point, which is low and green, and the Flat rocks which lie off it 1¼ miles to S. by E., form the east side of the channel between them and Belles Amours point, leading northward

to Belles Amours harbour, in which a great number of vessels may lie quite land-locked; and might even winter there as securely as in a dock.*

Nearly midway between Belles Amours point and the Flat rocks, lies a rocky patch with 13 feet least water. Between this patch and the point there are other patches with 3½ fathoms, which is as much water as can be counted on through the Western passage; but on the side towards the Flat rocks (that is, through the Eastern passage) there is from 6 to 17 fathoms of water, the soundings being extremely irregular and the ground foul.

Harbour point is about 1½ miles within Belles Amours point, and on the west side, is a bare granite hill, about 150 feet high, with several beacons of stones upon it, which are erected upon almost every hill, and are said to be for the guidance of travellers in winter. The shore between these points is lined with large boulders, and encloses a large and shallow pond, the centre of which is within Pond point, which is nearly opposite Stony point. The shoal water extends off, on this side, 1½ cables' lengths from the high water mark. The north-west side of Harbour point is of sand, extending (together with a flat which dries at low water) partly across the inner entrance of the harbour. Between this flat and the high and bold rocky shore to the northward, the narrowest part of the entrance of the harbour is a cable wide, with 6 fathoms water in it, over muddy bottom. North-eastward of Harbour point, and at the distance of about 160 yards, there is a small rock always above water; at a cable's length farther out in the same direction lies another small rock, which dries only at low water. There is no passage for vessels of any size between these rocks and Harbour point. The entrance is to the northward and westward round these rocks, and between them and the main land to the northward. The distance from Belles Amours point to the entrance is about 2 miles. On the east side of the entrance the shoal water and large stones extend from Stony point northward to the point of the North cove, which is only fit for boats. That side must therefore be avoided.

Water may be obtained in the north-west corner of Belles Amours harbour, and also from a considerable stream at the head of the North cove, where there are a few trees; but wood for fuel is very scarce on this coast.

DIRECTIONS.—To enter Belles Amours harbour by the Eastern passage, steer N. by W. ¼ W. so as to pass a quarter of a mile to the westward of the Flat rocks, and Harbour point will be seen open to the

* *See* Plan of Belles Amours Harbour, Middle Bay, &c., No. 1,145; scale, m = 2 inches.

westward of Stony point right ahead. Continue this course (taking care not to approach the west side of Stony point nearer than a long cable's length) until the east side of Harbour point is approached as near as a cable's length. Then steer North till the sandy part of the point is opened out, or the vessel is abreast of the rock above water off it, when she must haul a little to the westward, so as to bring the east side of Harbour point and Pond point in one. Keep them in one, in order to round the north extreme of the Flat, and a depth of 4 fathoms will be carried until Mark point (the extreme on the north side within the harbour) comes on with Peak point (a remarkable rocky point in Middle bay), seen over the low land at the head of the harbour, and bearing W. ¼ S. As soon as this mark comes on, haul sharp round to the westward, keeping at a less distance than a cable's length from the high north shore until the vessel is well within the sandy spit, when she may haul to the southward, and anchor anywhere, the bottom being of mud, and the depth from 5 to 7 fathoms.

To enter by the Western passage, which is preferable with a westerly wind, approach Belles Amours point on a bearing nothing to the eastward of E.N.E., and take care not to shut in Stony point behind it, for fear of the Middle ledges. Pass Belles Amours point at the distance of 2 cables, and go no nearer the shore, on that side, until past Pond point; then haul in gradually to within a cable's length of the east side of Harbour point, and proceed as before directed. As soon as the marks come on for hauling into the harbour to the westward, put the helm down and shoot the vessel in as far as she will go; then let go the anchor, and warp in the remainder of the way. It is only with easterly and southerly winds that a vessel can sail in. The bottom is good for anchoring outside Harbour point, but not outside Stony point.

MIDDLE POINT, which has several rocks off it a cable's length to the west and south, lies W. ¾ N. rather more than 1½ miles from Belles Amours point. The former is the south-west, and the latter the south-east extreme of the peninsula of low land separating Middle bay and Belles Amours harbour.

MIDDLE LEDGES lie to the southward of Middle point. Several of these ledges dry at low water, but the outermost, which is 6 cables' lengths off shore, has 15 feet least water. There is no safe passage between these ledges and the shore. Stony point kept half a point open of Belles Amours point, bearing E.N.E., will lead clear outside of them.

FIVE LEAGUES POINT, rather more than 1½ miles W.N.W. from Middle point, is the south-west extreme of another low, but smaller

peninsula, separating Five Leagues harbour from Middle bay. On this peninsula, three-quarters of a mile to the N.E. of the extremity of the point, there is a remarkable isolated and precipitous hill nearly 200 feet high, which marks the position of Five Leagues harbour from the westward.

LEAGUES and BARRIER REEFS.—Leagues Reef, off Five Leagues point, is partly above water, and extends a quarter of a mile to the S.W., and the two Barrier reefs extend to the distance of 1⅜ miles to the westward of the same point, but are not joined to it. The south extremes of Middle and Belles Amours points in line, bearing E. ¾ S., leads a third of a mile to the southward of the Barrier reefs.

MIDDLE BAY is a fine open roadstead, free from all danger, more than a mile wide, and extending inland 2 miles to the N.E. by N. In the outer part of the bay, for the first mile in, the shore, on either side, should not be approached nearer than 1½ cables' lengths, but farther in it is quite bold, excepting in the heads of the coves. The depth of water in this bay is from 4 to 13 fathoms over sandy bottom. The Middle ledges and the Barrier reefs are the only dangers in the way of vessels approaching Middle bay from the east or west.

The usual anchorage in Middle bay, in easterly winds, is outside of Isthmus cove, in 10 fathoms, sand bottom; and off West cove in westerly winds: and vessels shift from one to the other as the wind changes. As there are no islands off this bay, and as it is sufficiently roomy for the largest ships to beat in and out, it affords a very convenient occasional stopping place for vessels. It is the only open roadstead on this coast.

West Cove is a mile within the entrance on the west side of Middle bay. Its head is separated by a low and swampy isthmus from Five Leagues harbour. In the mouth of this cove, in 4 or fathoms, is the anchorage with westerly winds.

Shallop Cove.—On the east side of Middle bay, three quarters of a mile within Middle point, is Shallop cove, sheltered by two or three small islets close to the shore. It is only fit for boats.

About the same distance farther in, on the same side of Middle bay, is Peak point, high, and of granite. This point is forked—its south extremity is a ragged, isolated mound or peak; and off its west side, at the distance of half a cable, there is a large rock above water.

Isthmus Cove, carrying 3 fathoms water over mud bottom, is to the south-east of Peak point, which is the north-west point of the cove. It is a very small place, in which two or three fishing vessels are occasionally moored, under a reef which extends from the south side of the cove north-

ward towards Peak point. The reef affords indifferent shelter with W.S.W. winds, which blow right in with a heavy sea. The entrance between the reef and Peak point is only 140 yards wide; neither is there much more room between the reef and the shore to the eastward.

To enter Isthmus cove, Peak point must be kept close aboard; and when the vessel is half a cable's length past it to the eastward, haul her sharp round to the southward between the reef and the shore. The part of the cove, which runs in to the north-east of Peak point, is quite shoal. From this cove to Belles Amours harbour, across the low isthmus, the distance is less than half a mile.

Water may be obtained in Isthmus cove, as well as in the head of Middle bay, where there are a few small trees.

FIVE LEAGUES HARBOUR hardly deserves the name. It is a cove half a mile deep, with 2¼ fathoms water. It is situated three-quarters of a mile within, and on the west side of Five Leagues point, and is altogether unfit for any thing larger than a schooner of 100 tons at the outside. A W.S.W. wind rolls in a considerable swell, and there would be no lying there, if it were not for the indifferent shelter afforded by the Barrier reefs off its mouth. The channels leading in are about 3 cables wide, and on either side of the Barrier reefs; either from the southward through the Eastern entrance, between them and Five Leagues point; or from the westward through the Western entrance, between them and the shore to the northward.

DIRECTIONS.—The course into Five Leagues harbour through the Eastern entrance, is N.E. by N., passing a cable's length to the westward of Five Leagues point and its reef. Two small rocks, which just cover at high water, lie off to the westward of the South point of the harbour, which is a rocky islet joined to the shore when the tide is out. The outermost of these rocks is distant 320 yards from the point. Leave them both to the north-east, passing between them and the west point of the harbour, which is distant from them 2 cables' lengths. As soon as the vessel is past these rocks, the harbour will open to the eastward, and she must haul into it, passing midway between South point and a large rock above water, distant from the point 1⅓ cables to the north-west. Anchor in the middle, a cable's length within the entrance; for although there is water enough nearly to the head of the cove, and the anchorage is more secure farther in, yet it becomes too narrow for a stranger, and would require the vessel to be moored head and stern.

To enter Five Leagues harbour by the Western entrance, being to the westward of the Barrier reefs, stand in to the northward till the

harbour is seen to open, bearing nothing to the northward of E. by N. Steer directly for it, and as soon as the vessel is within the westernmost of the Barrier reefs, two ledges will be seen just under water, and several small islets on the side of the mainland. The ledges will be near a quarter of a mile to the northward, or on the port hand, but the course will lead within a cable's length of Bis islet, which is by itself, quite bold, a quarter of a mile off shore, about a mile from the entrance of the harbour, and opposite the centre of the Barrier reefs. Pass the west point of the harbour as close as is requisite, continue the course right in, and anchor as before directed.

There is also a channel a quarter of a mile wide between the two Barrier reefs, but they overlap in such a way as to make it difficult for a stranger. The two reefs cover an extent of 1¼ miles in an E.N.E. direction. There are parts of each of them that dry at low water, and the sea almost always breaks on them more or less.

SALMON BAY.—Salmon islet bears W. by N. 3¾ miles from Five Leagues point, and lies close to the south-east extreme of Caribou island, off which the shoal water extends nearly 4 cables' lengths to the S.E. Caribou island is about 4 miles in circumference, and 220 feet high above the sea, but it cannot be distinguished from the mainland from a vessel off the coast. Between this island and the mainland to the eastward of it, is the eastern entrance to Salmon bay, a cable wide, but has a depth of only 6 feet in it at low water. The other entrance to this deep bay is from Bonne Esperance round to the northward of Caribou island.*

There is plenty of water by this latter route, and also in the bay, which runs inland several miles to the north-east; but as a vessel will be already in a harbour, before she arrives at the navigable entrance of this bay, we shall not swell this book by any farther remarks respecting it, but refer to the chart, which will enable any one to find his way through a channel so perfectly sheltered from the sea. There are two houses just within the eastern entrance of Salmon bay, on the mainland side.

CAUTION.—An inspection of the chart will show that soundings in moderate depths of water extend sufficiently far off shore, everywhere between the Strait of Belle-isle and Salmon bay, to warn a vessel of her approach to the coast, at night, or in foggy weather.

ESQUIMAUX ISLANDS.—The mainland has hitherto formed the coast line, but at Salmon bay the islands commence, and continue 14 miles. They are of all shapes, sizes, and heights (less than 200 feet),

* *See* Plan of Bonne Esperance Harbour, No. 1,138; scale, *m* = 1 inch.

and run in order westward under the names of Esquimaux, Old Fort, and Dog islands. They are bare of trees, excepting some of those which are far in near the mainland. Off these islands lie many small rocks and ledges, the outermost of which are fully 4 miles from the mainland. To attempt to describe all these islands, or all the channels between them, would be an endless and useless task: and a good chart, upon a large scale, will, in most cases, be far more useful than any written description. We shall, however, notice briefly the principal dangers off the islands, the principal channels, and especially Bonne Esperance, which is the best harbour upon this coast.

WHALE ISLAND, the south-easternmost of the Esquimaux islands, is the southernmost of all the islands; and, in consequence, shows as the extreme to vessels close in with the coast, either to the eastward or westward. It is about three-quarters of a mile long, in a north-east and south-west direction, and about a quarter of a mile broad. It does not exceed 100 feet in height, in the highest part, which is a roundish hill near the centre of the island, on which there is a beacon, or pile of stones, supporting a pole of driftwood.

All vessels bound to Bonne Esperance endeavour to make this island. Its south point bears N.W. by W. $\frac{1}{2}$ W., $18\frac{1}{2}$ miles from the south point of Greenly island, in the entrance of the Strait of Belle-isle. A vessel, sailing from one to the other, will have soundings in moderate depths the whole way, excepting for a cast or two off the mouth of Bonne Esperance harbour, within 3 miles of Whale island. There are rocks, both above and under water, extending 3 cables off the south-west point of Whale island; but off its north-east point the shoal water reaches only to the distance of two-thirds of a cable. There is also a ledge with 9 feet water, lying W. $\frac{1}{2}$ S. $3\frac{1}{2}$ cables from its south-west point; and there are several rocks, dry at low water, lying a cable off shore, on the east side of the same point.

BONNE ESPERANCE HARBOUR.—From Salmon islet, noticed in page 146, the south point of Whale island bears W. by S. $\frac{1}{4}$ S. $4\frac{1}{2}$ miles. Within this line lie the islands which form the harbour of Bonne Esperance. Being very steep, and of bare granite, the largest of these islands look much higher than they really are; an effect which is also owing to the contrast of the much lower islands to the westward of them. There are none of them higher than 200 feet above the sea, and there are beacons, or piles of stones, upon almost every summit.

The main channel leading to this harbour is between Goddard and Beacon islets; Goddard islet being the westernmost of two low islets, joined by a reef to the south-west extreme of Caribou island.

Bold rock, at the end of a reef extending 1⅛ cables' lengths off the south-west point of Goddard islet, is small, always above water, and quite bold. Goddard rock, which is also small, and dries only at low water, bears South, and is distant 3½ cables from the same point. These are the only dangers on the eastern side of the channel. On the western side, Beacon islet, which is rather low, about 1¼ cables long, and with a pile of stones on its summit, will be seen bearing W.S.W., nearly a mile from Goddard islet. Tail islet lies 3 cables' lengths to the south-west, and Lark and another low islet to the northward of Beacon islet, but they are out of the way. To the westward of Beacon islet, and distant three-quarters of a mile, is Red Head island, from which Whale island bears W.S.W., and is distant nine-tenths of a mile. Fish islet, a large low rock, lies between the two last-named islands, bearing from the former West 2 cables' lengths.

Within Red Head island, and lying in a line to the northward, are Chain and Bonne Esperance islands, the former being two peninsulas, joined together by a narrow stony isthmus, and the latter being 150 feet high, and three-quarters of a mile long. Lion island is distant a quarter of a mile to the eastward from Bonne Esperance island, and there is a low islet and a narrow and difficult 3-fathoms channel between them. Off the east side of Lion island, and at the distance of half a cable lies the Whelp rock, always above water. Between this rock on the west, and Goddard and Caribou islands on the east, may be termed the inner entrance from the Main channel; it is 4½ cables wide, and carries from 10 to 13 fathoms water, over rock, sand, and mud bottom.

The dangers on the western side of the channel are the following:—

The Watch rock, small, and which always shows, lies a quarter of a mile to the eastward of Beacon islet, and at the same distance to the northward of it, and to the eastward of Link islet lies the Breaking ledge, which just covers at high water. The only other dangers, and they are only dangerous to a vessel of large draught, are two 4-fathom patches, the easternmost of which (Middle patch) bears South two-thirds of a mile from Beacon island; and the other (Whale patch) E. by S., nearly half a mile from the centre of Whale island. There is foul and rocky ground, with from 5 to 10 fathoms water between these patches, which may be avoided by a vessel approaching the harbour from the westward, by not coming into a less depth than 10 fathoms, until the leading marks for hauling into the harbour come on.

Wood and Water may be had in abundance from the mainland, but not from the islands.

DIRECTIONS through MAIN CHANNEL.—The prevailing winds along the coast are favourable for entering Bonne Esperance harbour, and

there will be no difficulty if the foregoing description and the following directions be attended to.

Being off the coast to the eastward, and with an easterly wind, stand in towards Caribou island, the position of which with respect to Whale island has been pointed out. When at the distance of half a mile from the south side of Caribou, the vessel will be in 10 fathoms water, and the south sides of Beacon and Red Head isles, and the north side of Fish islet, will be seen to come in one, bearing W. ½ N. Bear up upon this leading mark, or if not sure of the islands, steer West, with the lead going, and a trusty person in the rigging to look out for Goddard rock, to the southward of Goddard island. The depth will be about 9 fathoms at tow water, until the vessel is past that rock, when it will deepen suddenly into 15 or 19 fathoms, and she will then be in the channel.

The vessel must now haul in immediately N. by E., and Whelp rock will be seen right ahead, and in one with the west side of House island, which is low, has a house upon it, difficult to be seen, and lies close under the mainland at the distance of about a mile from Lion island. Run in upon this mark or bearing, and when past Bold rock, off the south-west point of Goddard island, haul a little to the eastward, so as to give the Whelp a berth of a cable's length. As soon as the vessel is within this rock, bear up W.N.W., and run along the inner sides of Lion and Bonne Esperance islands, passing between the latter and Anchor island (distant from it 2 cables' lengths to the northward) into the harbour, which is 3 cables wide between Bonne Esperance and Grand islands, and where the depth is from 12 to 16 fathoms over muddy bottom. In passing between Bonne Esperance and Anchor islands, the depth will not be less than 5 fathoms, unless the vessel approaches nearer to the islands than half a cable's length. Everywhere else there is much deeper water.

Being to the westward with a westerly wind, pass the south point of Whale island at the distance of half a mile, steering none to the northward of E. by N. to avoid the 4-fathom patches, until Whelp rock and the west side of House island, is brought in one bearing N. by E.; then haul in upon that leading mark or bearing, and proceed as before, excepting in case of the wind not being free enough to allow of passing between Bonne Esperance and Anchor islands. In this case a vessel must go round to the northward of Anchor island, and must not haul up higher than N.N.W. ¼ W., nor close in the Whelp rock with the south-west extreme of Goddard island, until she is past Anchor reef which covers at high water, and lies nearly 2 cables lengths off to the eastward of Anchor island, and is the only detached danger within the bay. Whelp rock and Goddard island touching, clear the shoal water round this reef at the distance of half a cable's length. As soon as Anchor reef is passed,

a vessel may haul to the wind, and minding that shoal water extends 1½ cables' lengths to the northward of Grand island (the high and large island next westward of Bonne Esperance island), she may make a tack into the harbour or anchor anywhere in the bay, where, although the depth of water is inconveniently great, yet the bottom is everywhere of mud, and the shelter complete in all winds. In short, the whole bay of Bonne Esperance may be considered as a harbour, in which there is room for a fleet of line-of-battle ships.

Through SHALLOP CHANNEL.—The other channels into Bonne Esperance require only a brief notice. Shallop channel, between Bonne Esperance and Grand islands, is very narrow, and has only 2 fathoms in it at low water. It may be approached from either side of Whale island, passing Fish islet, and then keeping the western sides of Red Head, Chain, and Bonne Esperance islands close aboard into the harbour.

Through ESQUIMAUX CHANNEL.—Esquimaux channel, so called because it leads direct to the eastern entrance of Esquimaux bay should be approached through Whale channel between Whale and Tent islands, the latter island being the next westward of the former. Whale channel is 8 cables wide, and carries a depth of from 10 to 18 fathoms water. There are no dangers in it that cannot be seen, excepting the 9 feet ledge mentioned as lying off the south-west point of Whale island: for the rocks, which lie half a mile off to the S.W. of Tent island, are never entirely covered.

The course through the centre of Whale channel, and across the wide, deep, and open space within it, to the entrance of Esquimaux channel, is N.E. ½ N. Esquimaux channel is between Grand and Fair islands on the east, and Spit and Stone islands on the west; between the inner islands (Fair and Stone) is the narrowest part, only 150 yards wide, and with 5 fathoms water. In passing through this, the equally narrow entrance to Esquimaux bay will be seen bearing N.N.E., distant half a mile, and the vessel must stand close over to it, before she hauls to the eastward through the North-west channel into Bonne Esperance bay. Then keeping within a cable's length of the main shore, to avoid the shoal which extends from Fair island fully half way across the channel, she should steer for the south side of the small and high Star island, and passing close to it continue her course towards Anchor island till past the shoal which extends 2 cables' lengths off Grand island, when she may haul to the southward into the harbour. Esquimaux channel is the only other besides Main channel which has water enough for large ships, but it is too narrow for vessels of any size excepting in cases of emergency.

Through WEST CHANNEL.—The remaining channel, between Spit and Stone islands on the east, and Esquimaux island proper on the west is called West channel; and is only fit for small vessels because of a bar

with only 2 fathoms water across from Stone island to a point on the western side of the east entrance to Esquimaux bay.

ESQUIMAUX BAY.—Esquimaux island is a large island, 7 or 8 miles in circumference, lying in the mouth of Esquimaux bay. There are many islands outside of it, and it cannot be distinguished from the mainland from a vessel off the coast.

The eastern entrance to Esquimaux bay is by a very narrow channel between the island and mainland to the eastward. This channel continues for 1½ miles to the N.N.E., and then opens into a wide space with two islets in it. But if the mainland to the eastward be followed, it will lead to the entrance of the Esquimaux river, where Mr. Chevalier's house and Trading Post will be seen on a sandy point, backed with spruce trees, on the west side, and rather more than 2 miles from Esquimaux island.* The boats of the *Gulnare* ascended the river 5 miles above Mr. Chevalier's house, passing through two lakes, in the uppermost of which there were 26 fathoms water. These lakes are separated by shallow and narrow channels. The river is navigated by canoes for many miles inland, and abounds with salmon.

Only small schooners can pass through the narrow channel between Esquimaux island and the main to the eastward; but there is water enough for larger vessels to the westward of the island. We must however refer to the chart for this route, for it would be quite impossible to convey any intelligible idea of such an intricate navigation through such a multitude of islands.

It may be mentioned here that there is a channel with 3 fathoms water in the shallowest part, and in general with a great depth of water, between the islands and the main, from Bonne Esperance to Mistanoque; but it can only be shown on a chart upon a large scale: no written description would be of any avail.

FORT BAY.—Proceeding westward outside of the Esquimaux islands, 4¼ miles W. by N. from the south point of Whale island brings us to the southernmost of the Fort rocks; and there is no channel for any vessels between the islands, in this distance, excepting Whale channel already described. The Fort rocks are a number of low rocks extending two-thirds of a mile to the S.W. from the south-west point of Old Fort island, which is of a very moderate height, and about 1½ miles in diameter.

* Mr. Chevalier has resided here all his life, and is the seigneur of an extensive domain extending several leagues on either side of Esquimaux river, and far back into the country. He holds this barren lordship (valuable for its salmon and seal fisheries) by grant from the King of France, given originally to some of the early French Fur Traders.

From this island a number of smaller islands extend north-eastward into the mouth of Esquimaux bay. There are also a number of steep and high islands extending north-westward from Old Fort island, across the bay of the same name. There are deep water channels, leading to Old Fort bay between the islands last mentioned, but too intricate for a written description to be useful.

Old Fort Channel is the principal of those channels leading in from sea, between the Fort rocks and Mermot islet, and farther in between Old Fort island and Channel island; which last, together with Crumb island to the north-east, must be kept close aboard until a vessel is in the wide and open space within the islands, and off the mouth of Old Fort bay, which runs in to the north-east, about 4 miles beyond the inner islands with deep water to its head.

Being midway between the Fort rocks and Mermot islet, the course in through Old Fort channel will be N.E. ½ N., with very deep water the whole way. Mermot islet is low, has a ledge off it a quarter of a mile to the S.W., and bears W.N.W. 1¾ miles from the outer Fort rock. This wide opening through the outer islands is the only navigable one besides Whale channel. Through it vessels may run in between the islands in the way just mentioned, or westward between the Dog islands and the main, but this we must leave the chart to explain. In some places between the islands there is more than 50 fathoms water, and the nearer the main the fewer the ledges.

DOG ISLANDS.—To the northward of Mermot islet is the Eider group, and westward of them the Dog islands, surrounded by rocks and innumerable ledges. The outermost of these rocks lies 4 miles W. by N. from the outermost Fort rock. The south-westernmost of the Dog islands are very low, but the highest islands, next the main, although small, are of considerable elevation. There is good anchorage between them and the main, but it can only be got at easily by running down with a westerly wind from Shecatica, close along the main land, and in the channel between the latter and the scattered rocks and ledges which lie off it; where there is very deep water the whole way, nearly 60 fathoms in some places.

PORPOISE ROCKS, three-quarters of a mile off shore, are two or three small black rocks above water lying W. by N. ¾ N. 3¾ miles from the outer Dog rocks, and an equal distance in the same direction will take us to Boulet islet.

The BOULET, about 1½ cables in diameter, is a smooth round backed islet, green at the top, and about 70 feet in height. Together with the

opening to Lobster bay, which bears from it E.N.E., 1¼ miles, it serves to point out the position of a vessel off the coast. Crab island is half a mile N.W. from it, and the Four rocks (within which is Inner islet) 4½ miles W. by N. These are the only islets between it and Shecatica; but there are many rocks and ledges between them, and also off the Boulet, to seaward.

PERIL ROCK, which is very small, dries at half tide, and lies 1½ miles S.S.W. from the Boulet, is the outermost and greatest danger off this part of the coast: the sea, however, almost always breaks upon it, and also upon the others which lie between it and the Four rocks. There is no warning by the hand-lead in approaching any of these rocks.

LOBSTER BAY, the position of which has been just mentioned, is a narrow inlet running 4 miles to the N.E., and quite open. It is from 1¾ to 2½ cables wide, between high and steep rocky shores. In the entrance there is 35 fathoms water, diminishing to 14 fathoms half way up: after which there is anchorage quite to its head, with muddy bottom everywhere; but it is completely exposed to south-west winds. Several very small streams enter the head of the inlet. There are two small islets close off the east point of the entrance of Lobster bay; a vessel must pass to the westward of them in going in.

ROCKY BAY, a mile to the eastward of Lobster bay, runs in N.E. by E. 1¾ miles, and is about 1¼ cables wide, between steep and high rocky shores. There are 39 fathoms water in its entrance, but the depth soon diminishes to 16 fathoms, and then shoals gradually to its head. One mile within the entrance, on the south-east side, there is a house and fish stage at a small cove, in which the fishermen anchor in 5 fathoms, mud bottom, well sheltered from all winds. A small stream enters the head of this bay. There is nothing in the way in running up either of these bays.

NAPETEPEE BAY is a straight and narrow inlet, very similar to Lobster bay. Its entrance is about 1½ miles to the eastward of Shecatica and 1¼ miles N.E. by N. from the Four rocks, which, together with the Inner islet just within them, must be left to the eastward in approaching this bay. The course and distance up Napetepee to its head, is N.E. ¾ E. nearly 4½ miles. In a vessel out at sea this bay shows open, upon that bearing, and, together with the Boulet islet, points out the position of Mistanoque harbour, which would not be easily made out by a stranger, if it were not for these remarkable features of the coast to the eastward of it.*

* *See* Plan of Mistanoque Harbour, No. 2,425; scale, *m* = 2 inches.

In entering this bay a vessel must pass a cable's length to the westward of some rocks above water, lying just within the mouth of the bay. Within these rocks the bay is 240 yards wide, with high and precipitous shores, especially on the west side. At the distance of 1½ miles, within the entrance, there is a small islet; pass to the westward of this islet, when the east shore must be kept close aboard until through the Narrows. Half a mile farther in, the bay is only 160 yards wide; but it soon expands again to 600 yards. The depth of water decreases from 30 fathoms in the entrance to 7 fathoms in the Narrows, and then increases to 27 fathoms with muddy bottom. There is no shelter with a wind right in, but much sea cannot roll into so narrow a place. Several small streams run into this bay; but the principal stream is on the south-east side, three quarters of a mile from its head, and is the outlet of a considerable lake, which cannot easily be entered by boat excepting at high water. A river abounding with salmon enters this lake, and an old hunter and fisherman lives near its mouth.

DIRECTIONS.—The three bays just described, have no dangers in them, but they are, nevertheless, by no means desirable places for vessels to go into, being so narrow, and having such deep water. Besides a sailing vessel cannot get out of them without a northerly wind, which in the summer months seldom occurs. Lobster and Rocky bays are preferable to Napetepee; and the safe and proper way of approaching them is from the westward, with a westerly wind, passing inshore between Shecatica, and the Four rocks; and then eastward close along the mainland, and between it and Inner islet, Crab islet, and the Boulet.

The Inner Channel between these islets and the mainland is not less than 3 cables wide, and the depth of water is from 33 to 48 fathoms, over muddy bottom. This deep water channel, close along the mainland, free from all dangers, continues eastward all the way to the Dog islands. Vessels might pass between the latter and the Porpoise rocks in clear weather, when shoal water could be readily seen, and when there is a sea running heavy enough to break upon the ledges, but the other is the safer plan of proceeding.

MISTANOQUE BAY.—The north-east point of Shecatica island bears N.W. ¾ N. a long mile from the Four rocks, and W.N.W. 3¾ miles from Boulet islet. The mainland from the Dog islands to Shecatica is of steep granitic hills (not exceeding 300 feet in height), with deep water close in to the rocks, and with only the few small islets and ledges off it which have been mentioned.

The two contiguous islands of Shecatica and Mistanoque lie close to the mainland, and would be difficult to distinguish from it, if it were not for

the Boulet, and the remarkable opening of Napetepee to the eastward, and the equally remarkable Shag islet to the westward. Shecatica is the eastern, the smaller, and the higher island of the two, being half a mile long, and 150 feet high.

Mistanoque island, separated from Shecatica by an unnavigable channel $1\frac{1}{2}$ cables wide, is nearly $1\frac{1}{4}$ miles long, parallel to the coast; broken into coves on the outside, and in the highest part 120 feet above the sea. It lies directly across the mouth of Mistanoque bay, which is about $1\frac{1}{2}$ cables wide, with a depth of 23 fathoms in the entrance, expanding to the breadth of $2\frac{3}{4}$ cables within, and running inland rather more than 3 miles N.E. $\frac{1}{2}$ N. The depth in this bay is from 27 fathoms in the centre, to 17 fathoms at the sides close to the rocks. It is not until a vessel arrives within less than half a mile of its head, that the depth decreases so as to be convenient for anchoring. The bottom is everywhere of mud; there are no dangers, and wood and water are plentiful.

MISTANOQUE HARBOUR, situated directly opposite the mouth of the bay, is a small bay on the north side of Mistanoque island, in which the depth is from 15 to 20 fathoms, mud bottom. Vessels may however anchor in less water, a short distance to the eastward, between the island and the east point of the bay, where the depth is 12 fathoms, but the channel is there only 160 yards wide. Vessels must moor in any case.

Mistanoque harbour though small, and with inconveniently deep water, is nevertheless a valuable harbour on a coast where good ports, fit for large vessels, are so scarce. The absence of dangers outside, the easy and immediate access, in either of the prevailing winds, in consequence of its having two entrances, are advantages possessed by none of the other small harbours to the westward, which may be equal to it in other respects.

DIRECTIONS.—Enter islet lies nearly half a mile to the westward of Mistanoque island; and nearly a cable's length farther is Diver islet, off which, to the southward, a reef of rocks runs out $1\frac{1}{3}$ cables' lengths. Both these islets are low. To the north-west of them, at the distance of 4 cables lies a group of small islands. The West passage to Mistanoque bay is between this group and Diver and Enter islands: it is nearly 4 cables, carries 23 fathoms water, and free from danger.

There is nothing immediately outside or off Shecatica, Mistanoque, Enter, or Diver islands, so that no other directions seem necessary than to run through the centre of either passage which may be preferred. The South passage between Enter island and the west shore of Mistanoque is, however, the best channel, being 4 cables wide, with upwards of 40 fathoms water in it, and bold to the rocks on either side. On

arriving at the West passage of Mistanoque harbour, which is about three-quarters of a cable wide, and has 9 fathoms water in it, give the north-west point of Mistanoque a berth of about half a cable, or keep well over to the mainland side of the entrance; but as soon as the vessel has entered this narrow channel, keep Mistanoque aboard, because there is shoal water off the west side of the entrance of the bay to the distance of 60 yards.

In entering from the eastward, the East passage between Shecatica and the Four rocks, which are quite bold, is more than a mile wide, with very deep water; but the north-east point of Shecatica must be given a berth of a cable's length until the channel between it and the main opens, bearing W.N.W.; for there are rocks off that point to the distance of 60 fathoms. The north-west point of Shecatica (on which there is the hut of a seal fisherman) must be kept close aboard, within the distance of 20 or 30 yards, for there is shoal water across a very small bay of the main opposite to it. The channel here being only 60 yards wide and having only 3 fathoms water in it, this East passage is only fit for small vessels.

SHAG ISLET, bearing W. ½ S. 7½ miles from Mistanoque, is the best guide for making the latter from the westward, as the Boulet, &c., as already mentioned, is from the eastward. The Shag islet is very remarkable, being small and high, with a round peaked hill looking green in the middle. There are many rocks off to the S.E. by E. from this islet; the outermost of which, distant from the islet 2 miles, is the Shag rock. Being three quarters of a mile off to the southward of the Shag rock, the south point of Shecatica will bear E.N.E. about 8 miles; and a vessel running upon this course, will pass more than a mile outside of the Three rocks, which are small and close together, lying nearly half way from the Shag rock towards Mistanoque; and before she runs as far as Mistanoque she will recognise Diver and Enter islands, one mile within her course, and may safely haul in towards them.

SOUNDINGS off the COAST.—The course along the coast, from off Whale island, so as to clear all dangers, to off Shecatica island, is W. ¾ N., and the distance 19⅓ miles. Off Whale island, soundings in less than 50 fathoms extend little more than 1½ miles; and at Mistanoque the deep water approaches close to the shore; but between these points there are soundings 3 or 4 miles off the outer rocks of the Old Fort and Dog islands, and fully 6 miles from the mainland. Off Boulet islet the depth is usually between 30 and 40 fathoms, over a varying bottom of sand, gravel, rock, and broken shells, but this will be seen in the chart.

LANE'S SURVEY.—Captain Bayfield's survey from the Strait of Belle-isle westward, ended at Mistanoque inclusive, and recommenced again at

Grand Mecattina. The intermediate coast was surveyed in 1768, by Lieut. Michael Lane, R.N. It was examined with his original chart in hand, and although his survey does not possess the exactness which superior instruments, and an improved system of hydrography, gives to modern maritime surveys, yet it is such as to confer honour on his memory, being quite sufficiently correct for the usual purposes of navigation. The following directions will therefore be taken, in part, from his original writing at the foot of his chart. But it must first be observed, that the latitude and longitude of the two extremities of his survey was carefully determined, and it was discovered that, although the relative bearing of his points was very nearly correct, yet the scale of his work erred in excess nearly 5 miles in the whole distance; which from the south extreme of Mistanoque island, to the south extreme of Cape Mecattina, is 43½, instead of 48 miles; the bearing being nearly S.W. (true.)

The variation has greatly changed since Lane's time, when it was 26° West. Now, in the year 1860 it is between 35° and 34° West; and the course by compass, so as to pass outside, and clear of all danger, from a mile off the south extremity of Mistanoque, to the same distance outside Flat island, is W. by S. ¾ S., and the distance 36 miles. The same course continued will pass about 2 miles outside the Murr rocks, which are off Cape Mecattina, and at the distance of 41 miles from Mistanoque. We must refer to Lane's chart, corrected in scale and in latitude and longitude, for the soundings along this course; merely remarking that they vary irregularly, from 28 fathoms, to no ground at 110 fathoms; and that the nature of the bottom is equally changeable.

ASPECT of COAST.—The coast between Mistanoque and Cape Mecattina is broken into large bays and inlets, between large islands of moderate height above the sea, and partially covered with moss. Many smaller islands, islets, and rocks are interspersed, and outside all the coast is lined with small islets, rocks, and ledges, in groups, or scattered here and there. The greatest difficulty is to pass safely through between the last; for within the islands, in most of the channels and wide spaces between them, as well as in the bays of the mainland, there is a great depth of water, amounting in one or two places to 50 or 60, and often exceeding 30 fathoms. In these deep water channels and bays, which are so intricate as to defy any attempt at a written description, small rocks are not nearly so numerous as they are outside, and are for the most part above water. The shores, too, of both the main and islands are almost everywhere quite bold, so that the largest ships might be conducted through many parts of these channels, and whole fleets might lie hidden in these obscure recesses full 15 miles in from the outer rocks. The entrances from the sea to these channels and bays, through the outer

islets and rocks are in general too intricate for any directions to be of use; we shall therefore refer to the chart for them, and merely introduce here, with slight alteration, Lieut. Lane's description of, and directions for, entering those harbours, which, although small, might be of occasional use to shipping.

From Shecatica bay to Ha-Ha bay the mainland does not appear; as the islands, great and small, and of different heights above the sea, are so numerous and so near together, that the coast cannot be distinguished till a vessel is among them.

CUMBERLAND HARBOUR, the entrance to which is between Dukes island on the west and Cumberland island on the east, bears N. by E. ½ E., 3 miles from the Shag rock (page 156), and is known by a remarkable and high hill on the mainland, about 10½ miles North from the entrance. That hill is the highest in the neighbourhood, and resembles a castle at the top, having steep cliffs like walls. The islands forming the harbour are of moderate height, the easternmost making in two round hills. This is an excellent harbour, the best and easiest of access on this coast. It has depth and room enough for the largest ships. Good water can be had in plenty on the east side of the harbour, but for wood you must go up Shecatica bay, which lies 3 or 4 miles to the north-eastward of the harbour, and runs inland to the northward many miles. This bay has many islands, branches, and narrow crooked passages, too intricate for any to attempt who are not well acquainted with the coast.

DIRECTIONS.—Cumberland harbour should be approached from between the Shag rock and the Three rocks, the latter being about 2½ miles E.N.E. from the former. In sailing in there is no danger in the way but what appears above water, excepting a small rock, lying S. by W., rather more than half a mile from the west point of entrance, which is about 2 cables wide. As soon as the vessel is within its outer points, haul over to the west side, and run along it to the inner point on that side, bearing N. by W. ½ W., about three-quarters of a mile from the outer east point of entrance. As soon as she arrives there she may haul to the eastward, and anchor anywhere in from 7 to 20 fathoms of water over good ground.

SANDY HARBOUR, on the southern shore of Sandy island, lies N.N.W. ½ W. 2¾ miles from Shag island. This is a safe harbour with good ground.

Water.—There is no wood to be had in Sandy harbour, but plenty of water.

DIRECTIONS.—On approaching Sandy harbour there are two ledges under water to be avoided. The first of these bears West from the Shag

rock, and South from the Shag island, being distant from the latter one mile. The second bears S. ¾ E. nearly a mile from the east side of the Egg rocks, and W. by N. from the summit of Shag island. A small reef with shoal water extends a quarter of a mile from Shag island towards this ledge, leaving a deep channel between, more than three-quarters of a mile wide. The course through the centre of this channel, direct for the west extreme of Dukes island, is N. ¼ W.

To sail into this harbour pass to the eastward of the Egg rocks (bearing N.W. by W. 1¾ miles from Shag island), and keep the starboard point of the bay (which is the west extreme of Dukes island, bearing N.E. more than half a mile from the Egg rocks), aboard on going in. A small rock will then be seen above water to the northward, lying over towards the east side of the entrance of the harbour. Pass on either side of that rock, and then steer in N.N.E. ½ E. for the harbour, there being nothing in the way but what appears. When through the entrance, which is about 2 cables wide, haul to the north-west into the harbour, and choose a berth in 5 or 6 fathoms.

PORT AUGUSTINE is a little harbour, in which small vessels may moor. It has a very narrow and intricate entrance, and is fit for small craft only. The approach to it is to the westward of Augustine chain, which is a chain of small islets, the outermost of which is a round smooth rock, with a high black rock half a mile to the westward of it. Between these last named rocks there is a ledge, which shows at one-third ebb. The passage is on either side of this ledge, and then northward along the west side of Augustine chain, but it deserves no farther description. Mr. Kennedy's seal fishing and trading post is or was at Port Augustine.

ST. AUGUSTINE RIVER.—The south extremity of Augustine chain bears W. ¼ S. about 7 miles from Shag island. Between them lies Square channel, the largest in between the islands, toward the mainland. It is too intricate for description: but 14 or 15 miles up it in a N.W. ½ N. direction is the entrance of the Augustine river, with a sand bar across it, dry at low water. There is plenty of wood at this river,

EAGLE HARBOUR, in Long island, has room and depth enough for the largest ships within, but the entrances are too narrow for anything but small vessels. The east passage, between the islets which form the harbour, and Long island, bears about N.N.E. 2½ miles from the Fox islands, and is the best and deepest, but has only 3 fathoms water. This part of the coast is very dangerous, being lined with small low islets and rocks, both above and under water, and nothing but a chart upon a large scale would enable any one to find Eagle harbour. The approach to it,

however, is on either side of the Fox islands, which bear N.E. ¼ N. 9 miles from Treble Hill islet, and West about 14 miles from Augustine chain.

FISH HARBOUR, bearing N. ¼ W. 4½ miles from the Boule islet, at the north extreme of Great Mecattina island, is a small cove of the mainland running in to the westward, with an islet covered with wood, and hence called Wood island, lying off its entrance. There is a passage on either side of Wood island, but that to the northward is the best, there being a ledge in the bay to the southward of the island, part of which, however, always shows; and a rock, with 2 feet least water, S.S.E. ½ E. nearly one third of a mile from the east point of Wood island. In the cove within the island there are 7 or 8 fathoms, with good ground and room to moor. It is, however, only fit for small vessels. Both wood and water may be obtained, and Mr. Robinson has or had a seal fishing and trading establishment at this place. There is no danger, but what appears, in approaching this harbour from either side of Great Mecattina island, excepting the ledges which have been mentioned.

HA-HA BAY.—Seal point, about a mile to the N.E. of Wood island, is the west point of entrance into Ha-Ha bay. The islands to the eastward contract the channel into this bay to the breadth of about a quarter of a mile, but there is plenty of water, and no danger but what appears above water. The best channel is close along the mainland, between Seal point and Round islet, leaving all the islets and rocks to the eastward. The bay runs in about 8 miles, N.E. by N., with a depth of water exceeding 60 fathoms in one part, and there are many good anchoring places, but as it is entirely out of the way of vessels, we shall not unnecessarily swell these remarks with that which is clearly shown on the chart.

GREAT MECATTINA ISLAND, about 3½ miles long, north and south, and about 3 miles wide, is distant rather more than 2 miles from Red point, the nearest part of the mainland to the north-west. The central part of the island is the highest, and rises about 500 feet above the sea. The granitic hills of this island are fissured in a remarkable manner, by empty basaltic dykes traversing the island, in a north-east and south-west direction, from one side to the other. These features, together with the position of the island, in relation to the high land inside of Cape Mecattina, 4 or 5 miles from it to the W.N.W., distinguish this island from any other land in the Gulf.

The Boule is a high and round islet, nearly joined to the north point of Great Mecattina island. There is a small rock above water close off it to

the N.W. by N.; and at the distance of about half a mile in the same direction, a patch of rocks with about 4 fathoms least water. Round Head, on the west side, is a high peninsula, connected to the island by a low isthmus. An islet and small rock, at the distance of a half and one mile respectively, lie off the south point of the island. E. by S., about 3 miles from the centre of the island, lies Treble Hill island. S.S.E. ½ E. 3 miles from the south point lies Flat island; and S.W., about 4 miles from the same point of the island, lie the two Murr islets, about a quarter of a mile apart, of considerable height, flat at the top, and precipitous all round. Treble hill and Flat islands are quite bold all round, and so also are the Murr islets, which swarm with sea-fowl. The Murr rocks are two small and low rocks above water, lying about half a mile to the S.E. of the southernmost Murr islet. To the N.E. by E., and more than a quarter of a mile from the easternmost Murr rock, there lies a ledge on which the sea generally breaks.

ISLAND HARBOUR is a cove one mile deep, and about 2 cables wide between Bluff head, the high north-east point of Great Mecattina island, and the Boule. This harbour is sheltered from easterly winds by a cluster of small islets and rocks, lying off its mouth, and leaving a safe passage on either side of them. If the south passage is used, keep Bluff Head aboard; and if the north passage, pass between the cluster just mentioned, and a small rock by itself, lying a quarter of a mile to the N.W. of it, and a cable's length from the shore of the Great Mecattina. The anchorage is near the head of the cove, in from 14 to 20 fathoms water over good ground, and both wood and water may be had.

MECATTINA HARBOUR, lying under the high land of Mecattina, is distant about 5½ miles N. by W. ¼ W. from the Murr islets; about 3½ miles N.W. by W. ¼ W. from Round Head in Great Mecattina; and N.E. 2½ miles from Cape Mecattina. It is a small but safe harbour, between Mecattina island and the mainland; being only about 56 yards wide in the western entrance, and about 130 yards wide within. In a vessel of any size, it is therefore necessary to moor head and stern, and with hawsers to the shore. The depth within is 6 and 7 fathoms over good ground; but only 3 fathoms at low water can be carried in through either entrance.

In the small bay between Mutton and Mecattina islands, wherein is the western entrance, there is no anchorage in consequence of the great depth of water; but there is no danger in the way, and it is only necessary to keep in the middle, to pass safely through the narrow western entrance. The eastern entrance is rendered difficult by a reef of rocks under water,

running across it to the northward from the north part of the island, and should only be attempted in fine weather, unless by those who are well acquainted with the place. Strangers in fine weather may anchor outside, between the east end of the island and the main, and send a boat in to examine the channel.

Wood and Water may be obtained in Mecattina harbour, and there is a Canadian residing there, who carries on the seal-fishery.

DIRECTIONS. — When sailing into Mecattina harbour, from the east point of the island steer N. by W. over to the mainland, and keep it close aboard, until the north-west point of the island, at the western entrance, is brought in one with the point of the mainland at the eastern entrance; the latter point being the south point of Dead cove, which is small, open to the eastward, and immediately to the northward of the eastern entrance of the harbour. Sail in with this mark on, till the north extreme of the island and the north extreme of Gull islet come in one. The vessel will then be within the reef, and must haul to the southward, towards the island, to avoid a ledge which stretches off the south point of Dead cove. Being close over to the island, she must haul to the westward into the harbour.

The sense of Mr. Lane's directions (page 157) have been given, because they may be useful to small vessels, or to others in light winds, a smooth sea, and fine weather, but under any other circumstances the slightest mistake or want of care on the part of the helmsman would place the vessel on shore; for the channel is so narrow, that there is scarcely room for a vessel to turn in it, or to allow of time for her to answer her helm in taking the turns which are required. The harbour is not above half the size assigned it in the book containing Cook's surveys, wherein there is a plan of it correct in every other respect. Gull islet lies E. by S. nearly a mile from the east end of Mecattina island, and there is no danger between them; but if a vessel approaching Mecattina harbour from the eastward wishes to pass between Gull islet and the main, she must keep either the one or the other aboard, in order to avoid the ledge, with 3 feet least water, which lies nearly half way between them.

PORTAGE BAY is on the east side of Cape Mecattina, about 2 miles N. by E. from its south extremity, and a long mile to the westward of Mecattina harbour; Mutton island lying between them. This bay runs in about 1¼ miles to the northward, between steep and high hills, fissured like Great Mecattina island, and there is a rapid river at its head. The deep water, with space for a vessel to anchor, extends only about two cables' lengths within the entrance, and there is a snug cove on the east side for small vessels.

PORTAGE HARBOUR is formed by a small and moderately high islet in the mouth of Portage bay, lying over towards the east side. In this harbour vessels of considerable size might find shelter in time of need, although it is inconveniently small for general use, like most of the harbours on this coast.

DIRECTIONS.—The passage into Portage harbour, to the eastward of the islet, has only 2 fathoms water in it, and so narrow as to be fit only for very small vessels. The western entrance is about a cable wide, and has from 6 to 8 fathoms in it. There is still more water within, over muddy bottom. There is no danger in this entrance, nor any directions necessary farther than to haul to the eastward, as soon as the vessel is within the island, and anchor off the entrance of the cove, or within it, as may suit the vessel. But approaching this harbour in a vessel of large draught, there are two ledges with 15 feet least water to be avoided. They lie in the line from the south extreme of Cape Mecattina, to the western entrance of Mecattina harbour. The north-easternmost of these ledges bears S. $\frac{1}{2}$ W. about 4 cables from the west end of Mutton island, and the other N.E. b. E., half a mile from the southernmost Seal rock, which lies near the shore on the east side of Cape Mecattina, and about three-quarters of a mile N.E. by N., from its south extremity. Shoal water extends about a cable's length off the Seal rocks to the eastward, but Mutton island is quite bold. Portage and Mecattina harbours are much frequented by schooners engaged in the whale fishery, and the scenery in both is strikingly beautiful.

CAPE MECATTINA is a long and remarkable promontory of the mainland, and of moderate height for some distance to the northward of its extremity; but about 3 miles to the northward it rises to the height of 685 feet above the sea. The highest part of what is called the High land of Mecattina, which rises directly in rear of Mecattina harbour, cannot be less than 700 feet above the sea, and is the highest land upon this coast from Bradore westward to the vicinity of Mingan. The granite of this promontory is traversed, from S.W. to N.E., by those enormous basaltic dykes which have been mentioned as occurring in Great Mecattina island. They cut completely through the promontory into Portage bay, ascending again on the eastern side of the latter, till they are lost to view beyond the summits of the hills. In Dyke island several of them are empty as low down as the surface of the sea; dividing the island by immense open fissures, in such a way as to distinguish it from all others in the neighbourhood. There is a small islet less than a cable's length from the end of the point with no channel between. At the distance of nearly 2 cables

farther out is Entrance island about 2 cables in diameter. Dyke island is 2 cables farther off in the same direction, and is composed of two islands at high water, but there is no passage even for a boat between. It is about 8 cables long, 4 cables wide, and about 150 feet high above the sea. At the distance of 9 cables from the south point of Dyke island, lie the two Outer rocks. They are above water, and there are several locks and ledges, and no safe passages between them and the island.

All these islands and rocks lie nearly in a line, S.S.E. from the south extreme of the promontory, from which the Outer rocks are distant 2½ miles. The northern Murr islet, which is the nearest of the two, bears S.E. by E. ¼ 2½ miles from the Outer rocks; and there is a clear and exceedingly deep channel between, the depth of water exceeding 80 fathoms. Vessels bound to Mecattina harbour either pass by this channel, or through between the islands; for there is a safe passage on either side of Entrance island. The channel between Entrance and Dyke Islands is the best, and has 13 fathoms water in it. The shoal water extends about half a cable's length off the east side of the former of these islands, but the latter is quite bold.

The COAST from Cape Mecattina to Cape Whittle is as dangerous as can well be imagined, to a stranger falling in with it at night, or in thick weather; and even to those who are quite acquainted with it, the navigation is not without much difficulty. Formerly it was not often visited, except by fishermen, eggers, and a few Quebec trading schooners. There have been instances of ships, after beating about the Gulf with adverse winds and bad weather, in the fall of the year, being wrecked upon it, as was clearly indicated by the quantity of wreck almost everywhere to be found on the islands.

On these melancholy occasions, the vessels either beat to pieces on the rocks, or, being hove off them by the sea, sunk afterwards in deep water. No record remained of their fate; they were placed on the list of missing vessels. Such of their crews as escaped to the shore perished miserably with cold and hunger on the barren islands, their remains having, in several instances, been found by the seal fishermen in the spring of the year. It is obvious that a correct chart may often prevent much of such misery, if it only be by pointing out the situations of those few trading ports, where alone assistance to support life during the long and severe winter can be found. But it will also inspire confidence in a vessel, suddenly finding herself entangled among the rocks, by showing that there are several good harbours, and almost everywhere places, where a vessel may be saved in time of need, although they would not be sought after under other circumstances.

The course and distance from Cape Mecattina to Cape Whittle is W. ¼ S. 55 miles; but this line passes 7 or 8 miles within the outer islands and rocks, so that it would be necessary to steer W. by S., from the Murr rocks, to pass outside the St. Mary reefs, which are the outer danger off the coast.

The depth of water immediately off, and even within the outer islands and rocks, is in general very great, often exceeding 70 or 80 fathoms, so that there is no warning by the lead; but in the offing, at the distance of 4 or 5 leagues, there are occasional banks of sand and gravel, with from 30 to 50 fathoms water. The outer islands are entirely bare of wood, but there are more trees on the mainland than in parts farther to north-east, indicating a slight improvement in the climate as we proceed to the south-west.

LITTLE MECATTINA ISLAND is comparatively a large island, being nearly 7½ miles long, in a N.N.E. direction, and about 3 wide. Salaberry bay, on its west side, cuts it nearly in two parts. All outside the narrow isthmus, namely, two-thirds of the island, is high and remarkable land, which can be seen from a great distance out at sea long after the other islands have disappeared below the horizon. The highest hill on the island is about 560 feet above the sea. The part of the island within the isthmus is a low and mossy swamp, resting on sand, with isolated ridges and mounds of granite piercing through it here and there. Within the island, to the north and west, are extensive flats of sand with boulder stones and small rocky islets.*

Little Mecattinna river discharges its waters through these flats by several shallow channels, the largest of which flows into Aylmer sound to the westward, and the shallowest into the Bay of Rocks to the eastward of the island. The latter channel has only 3 feet in it at low water, so that it is possible to wade across it, and from the island to the main when the tide is out. The river is large, and falls 30 feet over granite a short distance within the entrance, and about 2¼ miles N.N.W. from the north end of the island. Little Mecattina island, having thus no channel between it and the main for vessels, and scarcely even for boats at low water, may be considered as forming the west side of a large bay. The promontory of Mecattina forms the east side of this bay, which is filled with islands and rocks innumerable, among which no vessel could find her way, and where it is possible to lose oneself for a time in a boat.

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* *See* Plan of Little Mecattina Island, with Plans of Hare Harbour and Netagamu River, No. 1,164; scale, *m* = 1 inch.

The outer point of these islands is formed by the Fin rocks, lying nearly 1¼ cables' lengths off Whale Head, the south extreme of the Gore islands, and bearing W. by S. ¼ S. 10 miles from Cape Mecattina, and E. ¼ N. 5½ miles from Antrobus point, a small peninsula at the south-east extreme of Little Mecattina island. To the westward of the Fin rocks, at the distance of 2 and 3 miles respectively, lie the Herriot isles and the Single rock, with two or three sunken rocks close to it. Between these and Little Mecattina island there is a large open bay, the head of which is called the Bay of Rocks. Antrobus point is the south-west point of this bay, and has a ledge off it, a cable's length to the southward, which is the only danger off the south side of Little Mecattina island.

LITTLE MECATTINA COVE, on the east side of Little Mecattina island, about three-quarters of a mile to the N.N.E. of Antrobus point, is two-thirds of a mile long, and from 140 to 280 yards wide, between high, bold, and precipitous rocks. It has 10 fathoms water in the entrance, and there are 17 fathoms over mud bottom within. It is open to the E.N.E., but as the islands are only distant 3 miles in that direction, there is no doubt but that a vessel well moored would be quite safe in it; but it is too small, and has too great a depth of water, to be a favourite resort for vessels. The south-east point of entrance is called Cove point, and is quite bold.

Water may be obtained at the head of the cove.

HARE HARBOUR, also on the east side of Little Mecattina island, has depth and room enough for the largest vessels, but has several rocks and ledges in it, which render it difficult for strangers. Most of these dangers can be seen, and they are all distinctly shown in the Admiralty plan; with the assistance of which any vessel might enter this secure harbour, if she had a leading wind and fine weather. As it opens to the southward, the prevailing westerly or easterly winds are favourable for sailing in, and are generally accompanied with a smooth sea in the entrance. It is only when the wind is well to the southward, that there is any swell, and even then it never rolls into the harbour so as to affect a vessel.

DIRECTIONS with a WESTERLY WIND.—To enter Hare harbour with a westerly wind, steer N.N.E. ¾ E., so as to pass Antrobus point and Cove point at the distance of a third of a mile, and the Eden islands will be seen ahead, bearing from Antrobus point N.E. ½ N. 2½ miles. When the vessel has run three-quarters of a mile past Cove point, she will be close to the easternmost of the two Cat rocks, which are above water, about 2 cables' lengths apart, and bear East and West from one another. At the distance of 1½ cables to the northward of the easternmost rock,

lies Staff islet, about 150 yards in diameter; off which there is a rocky patch dry at low water, about a cable to the E.S.E.; this can always be seen from the rigging, but there is also a ledge with 2 fathoms least water, 320 yards E.N.E. from the north-east extreme of the islet. On this ledge the south-east extreme of the Eden islands and the small and high Nob islet are in one; the latter bearing from the former N.E. by E. $1\frac{1}{2}$ miles. These are the only dangers on the port-hand, or on the side of Little Mecattina island; and to the eastward, the nearest dangers will be more than a mile from the course.

When the vessel has run on the N.N.E. $\frac{3}{4}$ E. course, as before directed, one mile past Cove point, Staff islet will be abeam on the port hand, and ought not to be nearer than a quarter of a mile. From this position the entrance of the harbour will be seen bearing N. $\frac{1}{2}$ W. one mile. It cannot be mistaken, because there is no other channel through which a person can see clear into the harbour from that position. The entrance, about 340 yards wide, and 20 fathoms water in it, is between Daly and Price islands, and the only other channel is between the latter and the Eden islands, which have been already mentioned. Care must be taken not to take that channel by mistake, for a vessel would hardly get safely in that way, because of the numerous ledges. Daly island, forming the west side of the entrance, lies close to the shore, with only a boat channel between which cannot be seen through from outside.

Being abreast of Staff islet, continue the N.N.E. $\frac{3}{4}$ E. course about 3 cables' lengths farther, or till the entrance bears N.N.W., in order to clear the 2 fathoms ledge before mentioned; then haul directly in for the entrance, leaving the Eden islands, and also Price island, to the eastward, and giving the south-west extreme of the latter a berth of not less than 60 yards. Daly island, on the port-hand, or to the westward, is quite bold. About 340 yards within the entrance on the east, or Price island side, the small Watch rock will be seen above water, and farther in, a very small islet. This last is Bold islet, about a third of a mile within the entrance, 160 yards W.N.W. from the inner end of Price island, and quite bold. On the west side, bearing North 2 cables from the east extreme of Daly island, lies Safe rock, very small and above water, and is quite safe on its east side. Nearly midway between Safe rock and Bold islet lies Rag ledge, which just dries at low water. This is the principal danger in the way, but it can almost always be seen from the rigging, and there is a clear channel on either side of it, a long cable wide, and with from 12 to 15 fathoms water in it. The western channel, however, is the best; and the course from the centre of the entrance to it, so as to pass within half a cable's length of the Safe rock, is N. $\frac{1}{4}$ W. a third of a mile.

When within these dangers the anchorage must be chosen by the lead, for there are several patches of rock with from 4 to 6 fathoms, although the bottom is in general of mud, with from 9 to 14 fathoms water. In doing this, however, there is one more danger to be avoided, Foul rock, a 2-fathoms patch, bearing North 6 cables from the south-west point of Price island; and E. by N. ½ N., nearly 4 cables from the south side of the watering cove, which will be seen on the west side of the harbour. Until within this rock, therefore, a vessel should keep more than half way over from the islands forming the east side of the harbour, towards its western shore. She may if requisite run in nearly half a mile farther than this patch, and anchor to the eastward of Cluster point, which consists of some low small islets and rocks extending off the Little Mecattina shore; this position being the most secure in the harbour.

With an EASTERLY WIND.—When bound for Hare harbour with an easterly wind, steer West, so as to pass half a mile to the southward of the Fin rocks. Having run 2¼ miles upon this course after the Fin rocks were abeam, Scale rock (a 2-fathoms ledge) will be 4 cables to the northward, and also the Tail rocks, off the Herriot isles, at the distance of three-quarters of a mile. When the vessel has run one mile farther on the same course, Single rock will be seen, small and just above water, three-quarters of a mile on the starboard beam, provided there has been no tide or current. At any rate the rock will be seen, which has no other above water near it, being two-thirds of a mile to the westward of the nearest of the rocks off the Herriot isles; more than 1¾ miles East from Cove point, and S.S.E. 1½ miles from the Eden islands.

There is nothing in the way to the westward of the line from Single rock to the Eden islands, excepting the Cat rocks above water, and Staff islet, and its ledges already described as lying close to the shore of Little Mecattina island. On the contrary, there is a fine open bay, with plenty of room for the largest vessels to beat, and a depth in many places exceeding 50 fathoms. Single rock, however, must not be approached nearer than a quarter of a mile, because of three sunken rocks around it at the distance of 1½ cables, and with 1, 2, and 3 fathoms of water upon them. As soon as Single rock is made out, and is brought abeam steering West, haul in to the north-westward by degrees, so as to place the vessel half a mile to the westward of the rock, when the entrance of the harbour will bear N.N.W. with nothing in the way; and the vessel may be steered directly for it, and proceed as before directed.

All the bay within, or north-eastward of the Eden islands, as well as to the eastward of the line from them to Single rock, is dangerous, being full of sunken rocks, and shoal rocky patches, springing up through great depths of water.

There is a good watering-place in the small cove on the west side of Hare harbour, and wood may also be obtained in various places. There is usually a couple of men either in the entrance of Little Mecattina river, or near Little Mecattina cove, during the summer months. They were employed in the salmon and seal fisheries for Mr. Robinson of Fish harbour, but they do not remain during the winter. There are plenty of blue and cloud berries, &c., on the hills of Little Mecattina island; and whoever may take the trouble to ascend them, will be rewarded with a fine and extensive view of very peculiar scenery. The eye wanders over myriads of islands, and far inland among the barren rocky hills. Steep precipices, deep glens, and dark stagnant ponds fringed with dwarf spruce, juniper, birch, and poplar, are the nearer objects; and the whole conveys an idea of extreme barrenness. We are not sure that there is anything strictly beautiful in such a view, but it would seem that there is a degree of sublimity in the desolation of such scenery, which conveys very great gratification to the mind.

AYLMER SOUND.—The south shore of Little Mecattina island, extending from Antrobus point 3 miles W. by S. to Cape Mackinnon, the south-east point of Aylmer sound, is high and bold, with remarkable beaches of white boulder stones occasionally. There is a long cove close to the eastward of Cape Mackinnon, but it is of no use to vessels. Aylmer sound is formed by Little Mecattina island on the east, and the Harrington islands, together with the mainland, on the west; and is navigable about 4 miles to the N.N.E. from Cape Mackinnon. The course and distance across this sound from Cape Mackinnon to Cape Airey, the south extreme of the Harrington islands, is W. ½ S. 5 miles; but farther in, that is, from Paynter point to Craig point, the breadth is only 2 miles, and so it continues as far as it is navigable. Paynter point is formed of small islets close to the mainland, and the course and distance to it, along the east side of the Harrington islands, is N.E. ½ E. 4 miles.

AID and CLOSE ISLETS.—There is no danger on the west side of Aylmer sound but what appears and is close to the shore; but on the east side there are two small islets, the outermost of which, Aid islet, bears N.W. ½ N., and is distant 9 cables from Cape Mackinnon, and is 4 cables off shore. The other, Close islet, lies about half way between the Cape and Aid islet, and about a cable off shore.

SPRAY REEF, small, awash at low water, and bold all round, lies W. by N. 1½ miles from Cape Mackinnon; and W. by S. ½ S. one mile from Aid islet. This is the only danger in the entrance of the sound that cannot always be seen; and vessels had better pass to the westward of it, because we have not sounded between it and Aid islet,

where, however, we have no doubt that there is plenty of water, as there is also between the islet and the shore to the eastward.

DOYLE ISLANDS are four in number, but they appear from sea as two only. The two north-westernmost islands are very low, and close together, being joined at low water. The two south-easternmost are of moderate height, and also close together. Their east point bears N.N.E. 2 miles from Craig point, which is the west extreme of Little Mecattina, distant one mile from Cape Mackinnon. There are several small rocks and ledges in the channel between these islands, and also between them and Crescent point to the north-west of them; so that the only safe passage is to the eastward of the islands, and between them and the ledges which lie across the mouth of Salaberry bay. This passage is half a mile wide, with 18 to 23 fathoms water in it, the east side of the islands being quite bold.

LOU ROAD.—From the north-east point of the eastern Doyle island, Boot point (the south point of entrance of Louisa harbour), bears N.E.. and is distant 6 cables. Within or to the north-east of the Doyle islands, between them and Louisa harbour, there is a fine roomy roadstead, called Lou road, in which vessels may choose their anchorage in from 12 to 4 fathoms over muddy bottom; the soundings decreasing gradually to the north-west, from the line joining the eastern Doyle island and Boot point, over to Crescent point, a distance of about a mile. This roadstead is bounded to the northward by banks of sand and stones dry at low water, which extend across from the Dickson islands, forming the north-west side of Louisa harbour to Crescent point. It is through these banks that the Little Mecattina river discharges most of its waters, as mentioned in page 165.

LOUISA HARBOUR is about 2 cables wide at the entrance, and within, the space in which vessels can ride, in from 3 to 5 fathoms muddy bottom, it is a third of a mile north and south, by a quarter of a mile east and west. The harbour is open to the W.S.W., but all sea is broken off by the Doyle islands. The points of entrance are quite bold, and the best anchorage is $1\frac{1}{2}$ cables' lengths within them, in 4 fathoms, and in the southern part of the harbour.

DIRECTIONS.—The only directions for sailing into Louisa harbour, or into Lou road between it and the Doyle islands are, to keep the eastern side of the latter aboard, to avoid the ledges lying across the entrance of Salaberry bay, as already mentioned. When once inside of the island there is nothing in the way, so that a vessel may either anchor in the road or run into the harbour as convenient. In the Sound outside of the Doyle islands, the only thing to be guarded against is the Spray reef.

There are irregular soundings with as little as 11 fathoms over rocky bottom here and there, but in general the depth is from 19 to 23 fathoms with rock, sand, and mud bottom. The ground cannot be trusted until within the Doyle islands.

HARRINGTON ISLANDS extend northward 4 miles, from Cape Airey to the mainland, there being no channel within them, because of the multitude of small rocks. The longest of these islands is about 1¼ miles long, and several of the others are nearly as large. They are high islands, the highest being estimated at 350 feet above the sea. Between the outer and largest islands there is indifferent anchorage and deep water; but the channels leading to it are narrow, and too intricate for any directions to avail. In short, it is a very dangerous place, and useless, excepting to small vessels intimately acquainted with the coast.

BLACK REEF, lying off the Harrington islands, and bearing from Cape Airey S. by W. ½ W. 2 miles, is composed of low black rocks above water, about 1½ cables in diameter, bold, but with very irregular soundings around it, varying from 6 to 70 fathoms over rocky bottom.

MAJOR REEF, awash at low water, and very small, bears W. by N. 1½ miles from Cape Airey.

NETAGAMU ISLANDS, bearing W. by N. 4½ miles from Cape Airey, are small, with a remarkable mound on the largest of them. Between them and the Harrington islands there is a bay of the mainland with clay cliffs, and sandy beach at its head, and innumerable small rocks across its mouth.

NETAGAMU RIVER.—The entrance to this river bears N. by W. 1⅞ miles from the Netagamu islands, and may be known by the sandy beach, backed with a thick growth of spruce trees, on either side of its entrance. It is a large stream with deep water in the narrow entrance, and also within close up to the falls, which descend perpendicularly 50 feet, on either side of an island, and into a basin half a mile wide. These falls, which are N.E. by E. 1½ miles from the entrance, can be partly seen from the sea, when they bear N.E. by E. A semicircular bar of sand, dry at low water, with the exception of a narrow channel with 3 feet water in it, extends a mile out from the entrance, and is extremely dangerous to boats because of the heavy surf. The current in this river is rapid, and the bottom of the channel is rock; but small schooners may be secured on the eastern side, a mile within the entrance, where there are two huts, the temporary residence of salmon fishermen during the season. The hills of the mainland, 4 or 5 miles to the westward of this river, are rather higher

than is usual on this coast, rising to the height of 400 or 500 feet above the sea.

ST. MARY ISLANDS lie 7 miles off the mainland, and their east extreme bears W.S.W. 10 miles from Cape Airey. There are two of those islands so close together that they may be considered as one narrow island about 3 miles long, in a S.W. by W. ½ W. direction. Their height is 200 feet above the sea, and they are of bare steep granite, and bold all round.

CLIFF ISLANDS lie two-thirds of a mile to the N.W. from the south-west point of the St. Mary islands. There is a ledge which shows to the S.W. of them. The Cliff islands are one round and steep island, half a mile in diameter, with several small islets and rocks close to the westward of it, and deep water between them all. Between these and the Boat islands there is a safe channel half a mile wide.

BOAT ISLANDS, a cluster of small islands close together, lie W. ½ N. 2½ miles from the south-west point of St. Mary islands. They occupy a space of 1¾ miles in a W.S.W. direction by about three-quarters of a mile wide.

MIDDLE ISLANDS are a chain of islands, nearly joined at low water, with several small islets adjacent. The westernmost island is 2¼ miles long and 150 feet high. The whole group covers a space of 3½ miles in a W. by S. direction, by about a mile wide. There is a good anchorage in 10 or 12 fathoms between the westernmost island, and two smaller islands to the northward of it; but it is too small for large vessels and too intricate for description, and can only be approached from the eastward.

The Middle islands lie 1½ miles from the main, and there is no safe channel between, in consequence of the numerous islets and rocks. Between these islands and Boat islands there is a safe channel, more than a mile wide. In all these channels the soundings are irregular, and the ground foul. In some places there are only 15, whilst in others there are 40 or 50 fathoms water.

TENDER REEF is small and awash at low water. It bears N. by W. ½ W. nearly a mile from the northernmost of the St. Mary reefs, and W. by S. ½ S. 1¾ miles from the south-west extreme of the Boat islands.

ST. MARY REEFS, the most dangerous off the coast, are four ledges just under water, on some of which the sea always breaks. From the northern to the southern ledge the distance is a mile, and the latter

bears S.W. ¾ S. 3¼ miles from the south-west extreme of the Boat islands; W. by S. ¾ S. 6 miles from the south-west extreme of the St. Mary Islands; and S.E. ½ S. 3½ miles from the westernmost of the South-west islands, which are a group of small islets, of which the westernmost is high and round. There is a patch of 12 fathoms lying 2 miles out to the southward of the St. Mary reefs, and another of 8 fathoms, nearly as far to the westward of them.

There are irregular soundings and deep water around and between all these rocks and islets, but no warning by the hand-lead. There is a clear channel between the Tender reef and the South-west islands, and also between the St. Mary reefs and the Boat islands; at least there is nothing with so little water as 3 fathoms, since the sea often breaks in that depth, and we must have seen it.

WATAGHEISTIC ISLAND and SOUND.—Wataghеistic is a large and hilly island 3 miles long by more than 1½ miles wide. It is much broken into coves, and lies in the mouth of a large bay of the mainland, from which it is difficult to distinguish it from a vessel out at sea. Wataghеistic sound is a secure harbour between the island and the mainland. The eastern entrance is narrow and intricate, but the western entrance is half a mile wide; and although there are several rocks and ledges in it, yet it may be safely sailed through, with proper care and the assistance of the Admiralty plan, in the largest vessels. The east end of Wataghеistic island bears North, 6¼ miles from the Cliff islands; but there are many islets, rocks, and reefs between, which it would be tedious and useless to enumerate, so that it will be sufficient to remark that Cove island, which is the largest of them, is half a mile in diameter, and surrounded with rocks and ledges. It bears N.N.W. 4 miles from the north point of St. Mary islands, and there are thickly scattered rocks, both above and under water, all the way from it to the Netagamu islands, 6½ miles to the eastward.*

CAUTION.—If it were not that cases sometimes occur, in which a secure anchorage is indispensable to the safety of a vessel, we should not give any direction for Wataghеistic, which cannot be got at without passing through 7 miles of dangerous navigation. The following brief directions are given, with the caution that their use must be accompanied with a good look-out from the rigging, for it is impossible to be certain that every ledge has been found in such a place, although there is every reason to suppose that none have escaped notice.

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* *See* Plan of Wataghеistic Sound, Mary islands, &c., No. 1,119; scale, *m* = 1·7 inches.

DIRECTIONS for EASTERN ENTRANCE.—Being to the westward with a westerly wind, a vessel may either pass between the Tender reef and the South-west islands, and farther eastward between the Middle and Boat islands, or she may run down outside the St. Mary reefs, and then haul in to the northward between the Boat and Cliff islands, which is the safer route, and the one for which the following directions are given. Being then in mid-channel between the Boat and Cliff islands, steer N. by E., and that course will lead close to Bold rock, bearing N. ½ W. 2 miles from the western extreme of the Cliff islands, and East half a mile from the east point of the Middle islands. The Centre reef, which always shows, bears E. by N., 1½ miles from the Bold rock; and there is a clear channel between them, but not between the Bold rock and Middle islands.

If the vessel passes to the eastward of the Bold rock at the distance of 3 or 4 cables' lengths, as soon as she has passed that rock, alter course to N. by W., and when she has run 1½ miles, she will be in the line from the Cutter reefs to those which extend to the south-west from Cove island, and rather nearer the former than the latter. The latter reefs bear from the former E. by N. 2 miles, and some parts of both can always be seen. Continue the N. by W. course 1¼ miles farther, and she will be midway between the Black ledge and the Bare rocks, the latter bearing from the former E. by N. ¾ N. 1½ miles. Do not go near this ledge, which has not been sounded off. Alter course now to N.N.E. ½ E., passing to the westward of all the islets to the north-westward of Cove island and when the vessel has run 1¾ miles, Beacon islet will be seen (close to the south-east extreme of Watagheistic island, and with a smaller islet a quarter of a mile to the westward of it) a quarter of a mile a-head. Run down to the N.E. by E., past this islet, sufficiently far to avoid a reef and 3 fathoms patch, which together extend 4 cables' lengths off it to the N.E. by E.; then haul in N.N.W., giving the islet a berth of full half a mile, when the depths will be 10 or 12 fathoms.

When the vessel has run half a mile from the time Beacon islet was abeam, a deep bay will be observed in the east side of Watagheistic island. Steer for the narrow channel between the north point of this bay, and two small islets which lie nearly 1½ cables' lengths off it to the north-east. As soon as she arrives at these islets, another deep cove will be seen in Watagheistic island, with an islet nearly filling up its mouth. Steer to pass close to the eastward of this islet, and then N.W. for the channel between Watagheistic island and the islands to the eastward which extend across to the mainland in that direction, with the exception of a very narrow 3 fathoms channel. Keep in the middle of the channel inclining towards the west or the Watagheistic side. The channel is at first only about 170 yards wide, but it soon expands to 320 yards, with a

depth of 15 fathoms in the middle over mud bottom, where the vessel may anchor in great security. After she has passed the reef off Beacon island, there is nothing in the way by this route, the islands being quite bold.

If wishing to run through into the Upper sound, beware of a reef which lies across the mouth of the channel at the distance of $1\frac{1}{2}$ cables as will be seen in the chart. As there is no safe channel to the eastward of Cove island, a vessel cannot approach this anchorage with an easterly wind without first beating up along the south side of Watagheistic island, after she has passed between the Bare rocks and Black ledge, so that in that case the western entrance to Watagheistic sound is to be preferred.

DIRECTIONS for WESTERN ENTRANCE.—With an easterly wind, a vessel may either sail in from sea through the same channel as before, or to the eastward of the St. Mary islands, which is quite safe. Being to the eastward, steer for the north-east point of St. Mary islands, which may be passed at the distance of 2 cables, and then bringing it astern, steer from it N.W. by W. $\frac{1}{4}$ W., and the Centre reef, which must be looked out for, will be abeam at the distance of about a quarter of a mile to the northward, when $2\frac{3}{4}$ miles has been run from the north-east point of the St. Mary islands, from which the reef bears N.W. by W. $2\frac{3}{4}$ miles. The reef is bold all round, and it may be passed on either side at the distance of 2 cables, but to the southward of it is to be preferred.

Continue the N.W. by W. $\frac{1}{4}$ W. course for a mile past the reef, then haul up N. by W. $\frac{1}{4}$ W., and when the vessel has run $2\frac{1}{4}$ miles, she will be midway between the Bare rocks and Black ledge as before; run on the same course three-quarters of a mile farther, and the Seal islands, forming the north point of Boussier bay (full of islands), will bear West two-thirds of a mile. The channel to the westward between Watagheistic island and the mainland will now be open, and two small islets will be seen, nearly in its centre, in one, bearing W. by N. $\frac{3}{4}$ N. The nearest of these islets will be distant about $1\frac{1}{4}$ miles; they are a quarter of a mile from each other, and quite bold; but bear in mind that exactly in the line from the one islet to the other, and $3\frac{1}{2}$ cables' lengths E. by S. $\frac{3}{4}$ S. from the easternmost of them, is the Kettle rock, very small, and just covered at low water. This rock lies exactly in a line from the Seal islands to the point of a shoal cove of Watagheistic island, which is open to the eastward; there is a rock awash 160 yards off the point of this cove to the southward. The channels on either side of the Kettle rock, which is quite bold, are each a quarter of a mile wide, and have from 20 to 26 fathoms water in them. Having brought the islets in one, the vessel has only to avoid the Kettle rock, running in W. by N. $\frac{3}{4}$ N. on either side of it, and the two islets to the westward of it, and then hauling up to the northward under the west

end of Watagheistic island, where she may anchor in from 17 to 20 fathoms over mud bottom, with plenty of room, no dangers anywhere near her, and well sheltered from all winds.

From both the anchorages for which we have given directions, a vessel with the Admiralty plan may easily sail into the Upper sound to the northward of Watagheistic island, which is navigable throughout for the largest vessels, with a convenient depth of water, and good ground for anchoring. Wood and water may be had there in plenty, and in Hamelle harbour, at the eastern extremity of the sound, a hunter and salmon fisher resides; and there is another in Boussier bay, which has been noticed as lying to the westward on the way to the western entrance into the sound.

There is no good anchorage on the route to, or outside either entrance to Watagheistic, the soundings being irregular, with deep water and generally foul ground. The breakers on every side, on so many rocks and ledges, make the place look, as it really is, extremely dangerous.

ETAMAMU RIVER.—Between the Middle islands and Wapitagun, the mainland is broken into coves, and lined with islets and rocks innumerable, among which nothing but a very small vessel, well acquainted with the coast, could find her way. There is nothing there worthy of notice, excepting the rapid Etamamu river, which enters a bay open to the south-west, full of islets and rocks, and 4 miles N.E. from the eastern entrance of Wapitagun. At the mouth of this river, there is a trading and salmon fishery post, at which two men reside all the year.*

SOUTH MAKERS LEDGE is a small rock, which is never entirely covered when the sea is smooth. Its whole extent, above and under water, is 1⅓ cables' lengths east and west, by half a cable north and south, and there is no danger near it, excepting a patch of 4 fathoms, bearing from it S.E. by S., and distant 2 cables. The soundings are very irregular round this ledge. There are 54 fathoms three-quarters of a mile from it to the east, and nearly 60 fathoms 2 miles south. It bears West 9 miles from the St. Mary rocks, and the soundings between are of all depths from 8 to 50 fathoms, rocky bottom.

This dangerous ledge bears from Cape Whittle (the south-west extreme of Lake island) S.E. 6½ miles; but the Cormorant rocks lie directly between them, leaving a channel between those rocks and the ledge, nearly 2¾ miles wide. The soundings in it are irregular, between 13 and 30 fathoms, but there is no danger excepting the claws of the Cormorant

* *See* Chart:—Gulf of St. Lawrence, Sheet 3, No. 305; scale, m = 0·25 of an inch.

rocks, one of which, with 4 fathoms, stretches 3¾ cables' lengths S. ½ W. from the south-easternmost Cormorant rock; another E.N.E. from the Nest rock, and S.E. from Slime rock, (the north-east Cormorant,) three-quarters of a mile from each, with only 2 fathoms; and a 2 fathoms patch which bears N.E. ½ N. a quarter of a mile distant from the Slime rock. There is no channel between the Cormorant rocks, or between them and Lake island, excepting for small schooners the crews of which know the position of every ledge.

WAPITAGUN HARBOUR.—Mistassini, or the Great Stone, is a remarkable block of granite lying on the south-east extreme of the Outer Wapitagun islands, which bears from the South Makers N. ¼ E. rather more than 3 miles. The block of granite, just mentioned, resembles a mortar, especially when seen from the south-west, and has been called the Gun by the fishermen. It serves as an excellent guide to the East passage into Wapitagun harbour, the entrance to which is three-quarters of a mile to the eastward of it, and N. by E. 3½ miles from the South Makers ledge. The Outer Wapitagun islands, which are of bare granite, about 70 or 80 feet high, are so close together, and so overlap, that they appear like one island. They completely shelter the harbour, which is a long and narrow channel running east and west between them and Wapitagun island, which is next to the northward of them. The West passage of the harbour is 2 miles to the westward from the Mistassini; N.N.W. ½ W. 4 miles from the South Makers; N. ½ E. nearly a mile from Slime rock, the north-easternmost Cormorant; and 3 miles E. by S. ½ S. from Cape Whittle.*

The south shore of Lake island, between Cape Whittle and Cormorant point, its south-east extreme, is very remarkable, being quite straight in an E. by S. ½ S. direction, and composed of craggy cliffs of dark red granite, upwards of 100 feet in height, and stained white by the cormorants.

The west extreme of the Outer Wapitagun island bears E. by S. 6 cables' lengths from Cormorant point. There is a small islet nearly midway between these points, but within, or to the northward of the line joining them; a vessel must pass to the eastward of this islet in going into the harbour; the entrance being sharp round the western extreme of the Outer Wapitagun islands. The West passage into the harbour is about 160 yards wide, and there are parts of the channel, between islets within the East passage, which are not more than 120 yards wide. The harbour is nowhere more than 280 yards wide, excepting where there are small bays; so that although the depth of water is more than sufficient

* *See* Plan of Wapitagun Harbour, No. 1,148; scale, *m* = 2 inches.

for the largest vessels, yet the navigation is so intricate, that this harbour is not fit for those of a greater burthen than 150 or 200 tons.

Water.—There is water to be had on Lake and Wapitagun islands; but for wood the boats must proceed through the islands to the mainland, distant from the harbour about 3 miles to the northward.

Directions.—The position of the East passage into Wapitagun harbour, between the Outer Wapitagun island and others to the eastward has been pointed out, and, in approaching it from the southward with an easterly wind there is nothing in the way. There is a rock and ledge which shows on the west side of the entrance. Keep, therefore, the eastern side aboard, steering in N.W. by N. Three small islets will be seen a third of a mile within the entrance, and to the northward of them a cove in Wapitagun island running in to the westward round a steep rocky point, which has a small sunken rock close off it to the south-east. There is safe anchorage in 2½ fathoms in this cove, but if wishing to run into the harbour, leave all three islets to the southward, passing close to them, and then bear up to the westward, between them and the steep rocky point of the cove just mentioned. This is the safer passage; the other, to the southward of all three islets, is only 60 yards wide, and has besides a ledge in the way, which can only be avoided by having a trusty person in the rigging, which, by the way, is necessary at all times, in entering this and similar harbours.

To enter Wapitagun harbour by the West passage, and with a westerly wind, attend to the following directions, remembering that a look out for the ledges from the fore yard or the rigging is absolutely necessary, even with the best of charts. Run down between the Cormorant rocks and South Makers ledge, and then haul in North so as to pass half a mile to the eastward of the south-easternmost Cormorant rock, which will be readily known from the Nest rock, covered with birds and stained white by them, being about 240 yards to the westward of it. Look out now for the small Two-fathoms ledge which lies 4 cables' lengths to the north-east of the south-easternmost Cormorant, which leave also to the westward; and, having passed it, haul up to the westward a little, so as to pass not less than 3 cables to the eastward of the Slime rock (the north-east Cormorant), in order to avoid the other Two-fathoms ledge, which bears from it N.E. ½ N. a quarter of a mile.

Having passed close to the eastward of this ledge, steer directly for the islet in the channel, between the west extreme of the Wapitagun islands and Cormorant point, taking care not to haul up higher than N.N.W. ½ W. to insure passing to the eastward of Long ledge, which lies midway between Slime rock and Cormorant point, and on the line joining the west

end of the islet steered for, and the high east end of Lake island, which therefore to the westward must not be opened out of the islet. Having passed Long ledge, bring the west end of the islet to bear North, and steer for it, looking out for the 7-feet ledge, which lies 1½ cables' lengths to the southward, from the western extreme of the Outer Wapitagan islands, which should not be approached nearer than 2 cables' lengths until the ledge is passed.

The patch which lies 240 yards to the south-west of the islet, is quite bold, and will be avoided if the islet be not brought to bear to the eastward of North. When the vessel arrives within 2 cables' lengths of the islet, and the harbour begins to appear open to the eastward, take in after-sail instantly, so as to bear up quickly for the entrance, leaving the islet to the northward of the vessel. When once within the entrances the rocks are bold and the water smooth, and an anchorage may be chosen anywhere, the general depths being from 16 to 20 fathoms. The best berth, however, is in a small bay on the south side of the harbour, 6 cables' lengths within the West passage, in 7 fathoms. The bottom within the harbour is everywhere of mud, but outside it is all rocky, with irregular soundings.

There is no doubt, that to enter this and several other harbours described in this chapter, will be considered a difficult and dangerous affair, but if these directions be read carefully over before attempting the entrances, with the charts of the harbours in hand, they will be readily understood, and little difficulty will be experienced beyond that which may be overcome by a smart and seamanlike management of the vessel, placed under proper and reduced sail for the purpose, with a leading wind and fine weather, so that the ledges may be seen from aloft.

It will be observed on referring to the chart, that there is a patch bearing E. ½ S., 1½ miles from Slime rock. This has not been mentioned, because it will be ut of the way if the foregoing directions be followed; but we may as well add, that it bears E. by N. ½ N., three quarters of a mile from the Two-fathoms ledge to the north-east of the south-easternmost Cormorant rock.

TIDES.—It is high water, full and change, in Wapitagun harbour at 10h. 30m.; ordinary springs rise 5 feet, neaps 3 feet. The flood from the eastward and ebb from the westward usually run past the entrances of the harbour, at a rate varying from a half to one mile; but both streams are much influenced by the winds.

CHAPTER VIII.

GULF OF ST. LAWRENCE, NORTH COAST.—CAPE WHITTLE TO THE RIVER ST. JOHN, INCLUDING THE MINGAN ISLANDS.

VARIATION 32° to 27¼° WEST in 1860.

ASPECT of COAST.—From Cape Whittle, the south-west point of Lake island, Natashquan point bears N.W. by W. ¾ W., and the distance is 63 miles. With the exception of the first 13 miles eastward of Natashquan point, where the shore is of sand, this coast is of granite, which rises into steep hills and ridges, with rounded summits, having between them morasses and stagnant ponds. The mainland is seldom higher than 200 feet, even in the heads of the bays, and it diminishes in height towards the sea, as do also the innumerable small islands, islets, and rocks, which fringe the coast, and which in some parts extend fully 5 miles from the nearest point of the mainland. The islands are bare of wood, and so also is the main, excepting up the bays or where sandy tracts occur, which are always covered with a thick growth of spruce, with occasional birch and poplar.*

Seen from the distance of 4 or 5 leagues, this coast presents an outline so little diversified, that it is nearly impossible to distinguish one part of it from another; and it is only when a vessel approaches within 3 or 4 miles of the outer rocks that its broken and dangerous nature becomes apparent.

The outer rocks, both above and under water, are so bold that there is no warning from the use of the hand lead; but there are soundings with the deep sea lead in moderate, but irregular, depths, off every part of this coast. These deep water soundings are too irregular to admit of a concise description; we must therefore refer to the chart, with the remark, that they are sufficient to warn a vessel of her approach towards danger at night, or in fogs, since these depths do not amount to 50 fathoms at any less distance than 5 miles from the outer rocks.

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* *See* Charts :—Gulf of St. Lawrence, Sheets 3 and 4, Nos. 305, 306; scales, *m* = 0·25 of an inch.

The tides are weak, irregular, and influenced, both in their strength and direction, by the winds. For the time of high water on the full and change days, and the rise of the tide at different places, we must refer the mariner to the Admiralty charts.

WHITTLE ROCKS are the outermost of the many small rocks above and under water, lying off to the southward and westward of Cape Whittle. They are two half tide rocks, and are distant from the Cape 2¾ miles.

All these rocks are steep, with from 20 to 40 fathoms of water between them, and small fishing and egging schooners find their way among them, as they do almost everywhere among the islands and rocks of this coast, being guided by the eye; for every danger upon which such small vessels would strike can be seen in clear weather.

WOLF BAY, the first inlet to the westward of Cape Whittle, is 6 or 7 miles deep. There is plenty of water in its intricate channels, and few dangers that do not show, but a number of rocks and ledges extend across its mouth from Cape Whittle to Wolf island, and are so scattered about that no directions would be of the least use. If ever any circumstances should render it desirable for a vessel to enter so dangerous a place, it can only be done by looking out for the ledges from the mast-head, or fore-yard, in fine clear weather, or by avoiding the broken water when there is a heavy sea running.

WOLF ISLAND may be easily recognized, being higher and larger than the outer islands usually are off this part of the coast. It is about three quarters of a mile long, and makes in two hills, which are about 150 feet high.

OUTER ISLET is small, low, and lies about a mile to the S.W. of Wolf island. As its name implies, it is the outermost of a chain of islands, which extends 4 or 5 miles from the point of the mainland dividing Wolf and Coacoacho bays. It bears W. by N. ½ N., 7 miles from Cape Whittle.

COACOACHO BAY* is the only place affording anchorage to large vessels upon this part of the coast. It is not at all difficult of entrance, although the number of islets and rocks in every direction make it appear so. There is an excellent harbour in the head of the bay, called the Basin, and another formed by an arm running into the E. by N., and named Tertiary Shell bay, which is equally safe. Farther out than these harbours the bay is more than half a mile wide, and quite sufficiently

* Coacoacho means a great owl.

sheltered from the sea for the safety of any vessel with good anchors and cables.*

Outer islet, Wolf island, and the islets and rocks between them and the mainland, may be considered as forming the south-eastern side of the bay; and the Audubon islands and rocks as forming the north-western side of the bay. The entrance of the bay is, therefore, between the two extreme points, which bear from each other N. by W. and S. by E., and are distant about 2½ miles.

GRANGE ROCK, on which the steam-ship *North America*, Captain W. Grange, touched in September 1858, is the easternmost of three dangerous ledges lying off the entrance of Coacoacho bay. It is the shallowest part of a narrow ridge of rocks about three-quarters of a mile long in a W.S.W. direction, and which is shown by breakers only when there is a heavy sea running. From the least water on it, 15 feet, Outer islet bears N.E. by N. nearly 1¼ miles: and from its south-western end, in 3 fathoms, the same islet bears N.E. ½ N., 1½ miles.

SOUTH BREAKER, which also shows only in heavy weather, bears from Outer islet W. by N. ½ N. 2 miles, and from Grange rock N.W. ½ N. 2 miles. It has less than 12 feet water on it, and is near the north-eastern end of a ridge of rocks, which extends from it 7 cables to the S.W. ½ W., with 16 feet water near its outer extremity.

S.W. BREAKER, with only 3 feet water on it, bears N.W. by N. 2¼ miles from the South Breaker, and West 2½ miles from Audubon point. There are clear channels between these ledges, which may easily be avoided by the chart, or if the weather be clear they will be readily seen from the fore-yard of a vessel.

DIRECTIONS.—To enter Coacoacho bay by the most direct channel between the Grange rock and the South breaker, proceed as follows:—Being not less than 3 miles from Outer islet, bring it to bear between N.E. ½ E. and E. ½ N., and steer for it until the vessel is within the Grange rock and the South breaker, or until Outer islet is distant not more than a mile, when the rocks which lie about half a mile to the northward of the islet will be plainly seen. Pass to the westward of those rocks, at the distance of 3 or 4 cables, and when abreast of them, a chain of low rocks, which project to the S.W. from Emery island, will be seen right ahead. Bring the point of this chain to bear N.E. ¾ N., when it will appear on with the extreme point of the mainland on the north-west side near the head of the bay.

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* *See* Plan of Coacoacho Bay, No. 1,142; scale, *m* = 1 inch.

Steer in upon this leading mark or bearing until the vessel is past some rocks which lie 6 cables from the east side of the Audubon islets. These rocks, which are dry at low water, and can always be seen, must be left on the port or north-west side, and, having passed them, haul to the northward a little, so as to leave the Emery rocks, which are quite bold, on the south-east or starboard side. Their outer point bears N.N.E. ½ E. 3 miles from Outer islet, and when up to them, the bay will be seen open right ahead, and clear of danger, excepting Milne reef, which is partly dry in low tides, and extends nearly three quarters of a mile out from the Low rocks; its outer end lying nearly in a line from Tertiary point to Crocodile islet on the west side of the bay. To pass to the westward of it, keep Audubon point shut in behind Milne point and Crocodile islet. The bottom, outside, is either of rocks or sand, with a depth of from 12 to 30 fathoms; but as soon as the vessel is within the points of the mainland, just within Emery island, mud bottom will be found, with a depth of from 10 to 20 fathoms. The farther in, the better the ground, and the less the swell with south-west winds, which are the only winds that send any swell into the bay. The best berth is on the western side of the bay, half a mile within Crocodile islet, in 9 fathoms, mud.

If wishing to run into Tertiary Shell bay, there is nothing in the way excepting a small rock above water, a quarter of a mile within the entrance, which must be left on the starboard hand; and which, like the shores on either side, is quite bold. This bay is not more than 1¼ cables wide, half a mile from the entrance, but it becomes wider within, with from 5 to 11 fathoms water over mud bottom, and is there quite land locked.

In running in for the Basin, keep the north-west side of the bay aboard until the vessel is within half a mile of the island in the head of the bay. Then sheer over to the eastward, towards that island, to avoid a shoal of boulder stones which extend nearly 2 cables off the west side of the bay. The channel between this shoal and the island is only a cable wide, but deep enough for the largest ships. Give the island a berth of 100 yards, leaving it to the eastward or on the starboard hand, and, as the vessel passes through, she will deepen her water from 9 to 19 fathoms, the latter depth being just within the island. As soon as she is past the inner end of the island, haul to the N.W., into the mouth of a small bay, and the water will soon shoal to 8 fathoms, muddy bottom, where she must anchor, and will be quite sheltered from every wind. The Basin becomes quite shoal immediately above this anchorage where there is another island lying in the entrance of Coacoacho river.

Coacoacho river flows through a wide and shallow channel full of

boulders, and discharges the waters of a large lake, which boats can ascend to with the tide. Its shores are wooded with spruce trees, and water may be obtained near the western side of the entrance. At present, 1860, there is only one Canadian family, who reside on the west side close up to the rapids, and live by salmon and trout fishing in summer, and by hunting in winter.

In running for Coacoacho bay from the westward, a vessel may either pass between the S.W. and South breakers, by bringing the inner or north-east end of Wolf island to bear East, and steering for it; or by bringing Outer island to bear nothing to the southward of E. ½ N., and running towards it, until she is within less than a mile, when she may haul in for the Emery rocks, as before directed.

TIDES.—There is very little stream of tide in Coacoacho bay, but a weak and irregular stream of flood and ebb sets through and between the islands. It is high water, full and change, at 10h. 30m., and ordinary springs rise 5 feet, and neaps 3 feet.

OLOMANOSHEEBO RIVER.—The coast, for the first 12 miles westward of Coacoacho, is formed of innumerable islets and rocks to Olomanosheebo, or Paint river, which is called also by the Canadians, "La Romaine." This is a considerable river, falling 20 feet over granite into the head of a bay 4 miles deep, but so shoal that boats can scarcely enter it at low water. There is a trading post of the Hudson Bay Company on the east side near the Falls, neither of which can be seen from the sea, being hidden by the islands; but the place may be known by the low sandy cliffs, thickly wooded with spruce trees, on either side of the entrance of the bay.

TREELE ISLET and LOON ROCKS lie to the westward, the latter at the distance of 6 miles from the above bay. The Loon rocks, which can always be seen, are distant 3 miles from the nearest point of the mainland, and are the outermost danger off this part of the coast.

WASH-SHEECOOTAI* BAY, lying 10 miles to the westward of Olomanosheebo, is 2½ miles wide, and has off its entrance several small rocky ledges which make it difficult of entrance. Cloudberry point is the west point of this bay, and is formed by the mainland. The east point of the bay is formed by small rocks and islets. At the distance of 3 miles within Cloudberry point the bay contracts to a very narrow inlet, having several rocks and islets in it, and from 4 to 2½ fathoms water over muddy bottom, for the first 4 miles up; after which it becomes shallow

* Which means Cloudberry.

for 4 miles farther, to the falls of a considerable river, where there is a trading post and salmon fishery of the Hudson Bay Company.

This inlet is completely open to winds from the southward and westward, and affords scarcely any shelter for the first 5 miles within Cloudberry point. Vessels of considerable burthen might find shelter in it in time of need, but it is too intricate a place for the general purposes of navigation, or for any written directions to be of avail. Coasting schooners which know where to look for all the ledges, enter it by keeping a person at the mast-head, or in the rigging.

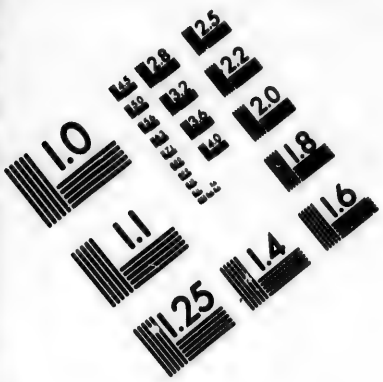
MUSQUARRO RIVER, where there is a Hudson Bay Company trading and fishing post, is 4½ miles westward of Cloudberry point, and is situated 3 miles within the w[illegible] point of a bay, full of small islets and rocks. This river becomes rapid [illegible] short distance within the entrance; 6 feet can be carried in at low wat[illegible] but it is a very intricate and dangerous place; useless excepting to [illegible]ats, or very small schooners. It will be known by the houses which are on the east side of the entrance, and also by a remarkable red and precipitous ridge of granite, about 200 feet high, and about 2 miles to the westward of the river.

KEGASHKA BAY.—Curlew point, at half a mile off which there are several low bare rocks, and ledges which always show, is 4½ miles to the westward of Musquarro, and is the east point of Kegashka bay.*

This bay, situated between Curlew and Kegashka points, is 3 miles wide, and 1½ miles deep. In the western half of the bay there are several small islets, too wide apart to afford much shelter from the sea. It is only in the north-west corner of the bay, within Kegashka point, that a vessel can be secure from southerly winds; there is room there for several small schooners, but for only one vessel of the size of a sloop of war, and she must be moored with an open hawse to the eastward, with a third anchor on shore to the south-west, so as to be able to haul in close under the point when it blows hard from the southward. The depth of water within the islets is from 4 to 6 fathoms, over fine sandy bottom. Altogether, this is a wild place, although small vessels may contrive to shelter themselves there sufficiently to run but little risk during the summer months.

Kegashka point is formed by an island, separated from a rocky peninsula by a very narrow channel, dry at low water; and the peninsula is united to the mainland by a narrow sandy isthmus covered with grass. Both the island and peninsula are distinguished by being partly covered

* *See* Plan of Kegashka Bay, No. 1,139; scale, *m* = 2 inches.



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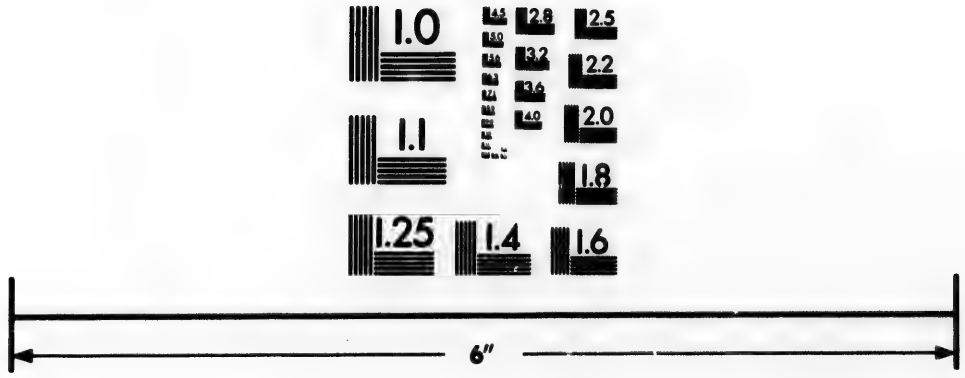

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with spruce trees. There are also a few spruce trees on an islet, three-quarters of a mile to the westward of the point, and as no other islands on this part of the coast are wooded, the bay may be recognized by that circumstance. There is a fine sandy beach, and low sandy cliffs in the north-west corner of the bay; and there are also similar cliffs for about a mile to the westward of the isthmus above mentioned. This sandy tract is densely wooded with dwarf spruce, another circumstance which serves to distinguish this bay, and is the origin of its name, which signifies impenetrable woods. On a near approach the place will also be known by Green island, which is of low granite covered with grass, and is the outermost and largest islet sheltering the bay: being about three cables' lengths in diameter, and situated three-quarters of a mile to the eastward of Kegashka point. There are several small islets and rocks within, and also to the eastward of Green island, and one small and low black islet between it and the inner part of Kegashka point.

Wood and Water may be obtained without difficulty in the western part of Kegashka bay, where there are several Canadian families. Their houses are visible from the sea. They have gardens, and keep sheep and cattle; and they also prosecute the fisheries and winter hunting.

DIRECTIONS.—The safest channel into Kegashka bay is between the low black islet and Kegashka point, and is 340 yards wide, and carries 8 fathoms water. The other channels have dangers in them, but this is quite clear, and the only direction necessary, when coming from the westward, is to give the south extremity of Kegashka point a berth of a quarter of a mile, or to go no nearer than the depth of 8 fathoms: then run along the east side of the point, which is quite bold, leaving all the islets on the starboard hand. A distance of three-quarters of a mile on a N.E. $\frac{1}{2}$ N. course will lead to the narrow channel before mentioned, between the westernmost islet and the inner end of Kegashka point. Haul round the latter to the north-westward, at the distance of half a cable, and when within it, not more than the same distance, anchor in 5 fathoms, and secure the vessel by mooring, as has been before mentioned.

When approaching Kegashka from the eastward, give the low and small islets off Curlew point a berth of half a mile, to avoid the ledges off them, which dry at low water: then steer N.W. $\frac{1}{2}$ N., or so as to pass outside of Green island, going no nearer than a cable's length. Continue on that course till the inner or north-east extremity of Kegashka point bears North, which will be a distance of rather more than $3\frac{1}{4}$ miles from the ledges off Curlew point; then haul in, and pass between the point and the westernmost islet, as before directed, giving the south side of that islet a berth of at least a cable's length.

Kegashka bay has this advantage, that there are no ledges or other dangers off its entrance : so that a vessel is no sooner outside of Kegashka point than she has a clear sea before her.

KEGASHKA RIVER, affording shelter only for boats, is 3 miles to the westward of Kegashka bay. It has falls 40 feet high, and a fishing station of the Hudson Bay Company a mile within its entrance ; neither the falls nor the house can be seen from the sea.

NATASHQUAN POINT.—At the distance of 2½ miles to the westward of Kegashka river, fine sandy beaches, in front of sandy cliffs, 70 or 80 feet high, and a country thickly wooded with spruce trees, commence and continue to Natashquan point, a distance of 13¼ miles. Mont Joli, mentioned in all former remark books, has no existence, at least there is no mountain, nor even anything that deserves the name of a hill ; but near the termination of the sandy cliffs, which end at the south-west extremity of Natashquan point, the sandy ridge with spruce trees rises into a slight mound, a very little higher than the rest of the country. This is Mont Joli ; but so little remarkable in its appearance that we should not have noticed it, had it not been for its name.

Natashquan point, a remarkable sandy promontory, is the most southern point on the north coast of the Gulf to the eastward of the Seven islands, and seems naturally to separate the eastern division of the coast, which has been the subject of this Chapter, from that farther to the westward. As a concluding remark to the above account of the eastern division, it may be said that though there are few coasts more dangerous either to a vessel unacquainted with its nature, or unaware of its proximity in a dark night, or thick fog ; yet, with the assistance of the chart, due caution, and a constant use of the deep-sea lead, it may be approached with safety; and that a vessel may even stand close in to the outer rocks and breakers on a clear sunny day, provided there be a trusty person aloft to look out for shallow water, for the bottom can be seen in 4 or 5 fathoms of water.

FISHING BANKS.—Parallel to the coast from Musquarro point to Natashquan point, and at distances varying from 6 to 11 miles, there are banks of sand, gravel, and broken shells, on which the depth of water is between 24 and 40 fathoms. There is more than 50 fathoms in some parts, between these banks and the shore. Codfish are often caught in abundance upon these banks, principally by American schooners.

CAUTION.—Eight miles W. by N. ¼ N. from Kegashka point lies the rocky shoal mentioned in former editions of this work, and recently examined by Commander J. Orlebar, R.N. It has only 2 feet water on it, and lies exactly in the line between Natashquan and Kegashka points,

and is distant 1¼ miles S.S.W. from the entrance of a small stream named Long river. A vessel will avoid it by not going nearer to the shore than the depth of 17 fathoms.

Another rocky shoal with 24 feet least water is reported to lie about 2 miles to the S.S.W. of Curlew point.

One and a-half miles to the S.W., from the south-west extremity of Natashquan point, lies a small Cod bank, with little more than 4 fathoms at low water, over gravel bottom.

ASPECT of COAST.—From the south extremity of Natashquan point to Collins shoal, the outer danger off St. Genevieve, the easternmost of the islands, the course is N.W. by W., 52 miles. The coast included in this distance is low near the sea, rising a short distance back into mounds and ridges, but nowhere exceeding 400 feet in height. It is composed of primary rocks, with the exception of a sandy tract at the Agwanus and Nabesippi rivers. The sandy tracts are always thickly wooded with spruce trees, and the country generally is here less bare than it is farther to the eastward.

The coast is broken into numerous coves and small bays, affording shelter everywhere to boats, and occasionally to very small schooners. The small and bare islets and rocks are innumerable along it, but nowhere extend farther out from the points of the mainland than 2 miles.

When there is a heavy sea running, all these dangers show, or they can be seen from the mast-head in clear weather; but under other circumstances, the depth of 20 fathoms is as near to them as a vessel ought to approach, that depth being in many places not more than a mile from the outer ledges.

The banks of sand, gravel, and broken shells, which extend off this coast for many miles, and the deep water channel between them and Anticosti, have been already mentioned in page 33; and the soundings upon them are too irregular to admit of any other than the general description there given of them. We must therefore refer to the charts, in which the various depths and nature of the bottom are given in such a way as cannot fail to be of great assistance to vessels navigating this channel.

CURRENTS and TIDES.— A current down along the coast in westerly winds has also been mentioned in pages 28 and 34; its rate seldom exceeds half a knot, and is usually much less, so that a vessel can always make way to windward in moderate weather.

In shore there are weak tidal streams too irregular to be depended upon. It is however important to remark, that the flood draws strongly into Natashquan river, and the bay at Little Natashquan; while the ebb sets

strongly off Natashquan point to the south-east, and causes a very heavy sea upon the banks off it, in southerly winds.

On approaching St. Genevieve, a strong in-draught of the flood towards the channel, between that island and the main, will be experienced; and the ebb will be found setting strongly out in the contrary direction: that is, to the south-east. The rate of these streams seldom exceeds a mile per hour.

NATASHQUAN RIVER (the name signifying "where the seals land") enters the sea on the west side of Natashquan point, and 3 miles north-westward from its south extremity. The mouth of the river, between low sandy points, is fully a mile wide, but nearly the whole of this space is occupied by a low sandy island, having narrow channels on either side of it. The northern channel is nearly dry at times, but the southern one has a depth of 6 feet at low water, and from 9 to 11 feet at high water, according to neap and spring tides. There is the same depth within, and small schooners may lie alongside the steep sandy bank, where the houses of the Hudson Bay Company's trading and fishing post stand, on the south side of the river, half a mile within the entrance. The bar of sand, on which there is usually a heavy surf, extends out three-quarters of a mile, and is exceedingly steep to seaward, where 20 fathoms will be found within a quarter of a mile. Codfish are taken in great numbers off this bar in the month of June, and the river abounds with salmon.

Above the trading post the river is full of sand-banks, dry at low water, and only navigable for boats for a few miles to the first rapids; above which it is said to be lost in a great morass, about 12 miles inland from the entrance. It discharges a great quantity of water in the spring of the year. The sandy beach continues for 3½ miles to the N.N.E. of the entrance, terminating at the mouth of a small stream, called the Little Natashquan, which admits boats only at high water, and which is close to the eastward of the harbour of the same name.

LITTLE NATASHQUAN HARBOUR, formed by a number of islets and rocks, is only fit for vessels not exceeding 100 tons, although it has water enough for a sloop of war. The entrances, of which there are two, formed by a reef of rocks in the centre, are not more than 180 yards wide, between reefs, the extent of which under water cannot be seen, because the water is discoloured by the dark streams of the neighbouring rivers.*

The depth that can be carried in at low water by the west channel is 3 fathoms, and 5 fathoms by that which is between the central reef and the islets on the east side. The space within the reefs in which vessels can ride in from 3 to 5 fathoms, over sand and mud bottom, is only a

* *See* Plan of Little Natashquan Harbour, No. 1,140; scale, m = 4 inches.

quarter of a mile in diameter. This anchorage is defended by the main and islets from all winds excepting the S.W., in which direction there are reefs of rocks, some parts of which are always above water. In a strong S.W. wind, some sea comes over these reefs at high water, but never enough to endanger a vessel during the summer months. There are several rocky patches, with from 2¼ to 3 fathoms off the harbour's mouth; these, with the want of space to work in, and the difficulty of getting out with the prevailing southerly winds of summer, render this place of little use for the general purposes of navigation; but it is a valuable harbour for the fishermen, whose schooners of from 30 to 100 tons are well suited to the size and nature of the place, which is contiguous to excellent fishing ground, and affords every facility for drying fish.

DIRECTIONS.—The entrance of Little Natashquan harbour bears N. by E., 4 miles, from the southern entrance of Natashquan river, and a vessel, being off the bar of that river in 20 fathoms, should steer N.E. by N. nearly parallel to the sandy beach. When she has run rather more than 3 miles, and has decreased her depth to 12 fathoms, she will be about half a mile from, and will see the islets and rocks, which, commencing at the termination of the sandy beach, lie off the entrance of Little Natashquan stream, and form the east side of the entrance to the harbour. The westernmost of these islets is much larger than those which lie farther to the south-east, between it and the termination of the sandy beach. Bring the west point of that island to bear N.E by N., in 12 fathoms water, and the southernmost of the rocks at the termination of the sandy beach will bear E ¼ N.

From this position, by ascending the rigging for the purpose, the reef will be made out on the west side of the harbour, which extends rather more than half a mile, S.W. by S. from a rather high and round-backed islet of grey granite, with a wooden cross upon it. This islet will bear N. by E. ½ E. from the position above indicated, and the central reef, some part of which is always above water, will be seen between it and the islets and the point of the main, which, together, form the east side of the harbour. Steer N. by E. ½ E. for the islet with the cross on it, until abreast of the outer part of the reef to the westward which will be distant a long cable, and the vessel will be in about 7 fathoms water.

Alter the course now sufficiently to the eastward, to pass on that side of the central reef which may be preferred, giving its rocks above water a berth of not less than 120 yards, if the west channel is taken. The central reef is quite bold to the southward, and also on its east side, so that it may be approached within 40 yards when entering by the east channel; but bear in mind, in hauling round its north and north-east ends, that it

extends 140 yards under water from the rocks, which always show, towards the centre of the harbour. The best berth to anchor in is nearly in the centre of the harbour, in 4 fathoms, sand and mud bottom, with the rocks above water of the central reef, bearing S.S.W. ½ W., distant 360 yards, and the cross N.W. by W. ½ W.

WASETAWOOKA* BAY, 5 miles north-westward of Little Natashquan, is full of small islets, rocks, and ledges, affording shelter to shallops and boats. It is an intricate and dangerous place, and may be known by Shag islet, a large black rock lying off it, and farther out than the rest, being 1½ miles S.S.E. from the projecting point of the main.

AGWANUS RIVER, 10 miles north-westward of Little Natashquan, is a large stream, having rapids and falls 1½ miles from the entrance, which is narrow, and has only 6 feet in it at low water. There is no bar, but many small rocks, both above and under water, lie off its mouth to the distance of 1½ miles, and render the approach extremely dangerous. The east point of entrance is of rock, the other of sand, and there is a small islet, three-quarters of a mile from the river's mouth. From 9 to 12 feet can be carried up to this islet, above which the river expands into a basin, half a mile wide, and carrying 5 fathoms close up to the foot of the rapids. There is sandy beach for 1½ miles to the eastward of this river, and also westward of it to Nabesippi.

NABESIPPI† RIVER, 5 miles north-westward from the Agwanus, enters the sea at the extremity of a sandy point, 17½ miles N.W. ½ N. from the entrance of Natashquan river. The Nabesippi is a much smaller river than the Agwanus, and will only admit boats in fine weather. On the west bank, a short distance within the entrance, stands a house and store, being a trading post of the Hudson Bay Company, which can be readily seen from the sea.

PASHASHEEBOO, MUSHKONIATAWEE, and **WASHATNAGUNASHKA,** are small bays, full of small islets and rocks, which render their entrances so difficult and dangerous that no directions would be of the least avail. They are occasionally, but not often, entered by small coasting schooners intimately acquainted with the coast, and none but those who know every rock and ledge could either distinguish them or take a vessel in. The first named is open to the south-east. The second less intricate than the other two, is 2 cables wide, with 5 fathoms water in the entrance, and within ; it is open to southerly winds, but is nevertheless tolerably secure for small craft, which may lie close to the rocks. The

* Crooked. † Man's.

third is 1½ miles wide, with a chain of rocks above and under water across its mouth, not large enough, or close enough to afford much shelter, yet too close and too numerous for a vessel to find her way through without great difficulty and danger; 3 fathoms can be carried in, and there are 4 and 5 fathoms within.

WATCHEESHOO, bearing N.W. by W. 18 miles from the Nabesippi river, and E.S.E. 14 miles from St. Genevieve island, is a hill of granite, 127 feet high, and bare of trees. It is a peninsula, but appears like an islet, higher than the rest, when seen in a vessel from a distance. There is a fishing post of the Hudson Bay Company in a cove amongthe rocks, to the westward of it. Watcheeshoo and the Saddle hill, which is 374 feet high above the sea, are very remarkable, and serve to point out to a vessel her position off the coast. The latter is situated 6 miles inland from the former, in a north direction.

QUETACHOO-MANICOUAGON, and PHAENTHAL, are two contiguous bays, 4 miles north-westward of Watcheeshoo. The first, which is the most easternmost, is 2½ miles wide, and carries from 3 to 14 fathoms water, but so full of rocks and ledges as to be useless, excepting to the smallest schooners; it is open to the westward. The other is a much smaller bay, capable of affording shelter only to boats, and open to the southward.

APPENTAT BAY is full of rocks, of no use to vessels, because of the ledges under water off its entrance, and also within. Four fathoms can be carried into this bay, which is not used even by small craft, because there is an excellent harbour within St. Genevieve island, the south-east point of which is distant only 3 miles from it, in a S.W. by W. direction.

The MINGAN ISLANDS are of limestone, containing ammonites, orthoceratites, and other organic remains, many of which are similar to those of Anticosti. This limestone dips slightly to the southward, so that the islands are bold, and frequently cliffy, on their north, east, and west sides, whilst they are low and shelving towards the south, in which direction the reefs of flat limestone and other dangers exist. Ancient beaches, formed of water-worn pebbles of limestone, and flower-pot rocks, precisely similar to those which are forming at present out of cliffs that are washed by the waves, are met with in most of the islands, far above the reach of the highest tides.*

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* *See* Charts of Mingan Islands, Nos. 1,132, 1,133; scales, m = 0·3 of inch.

The general character of these highlands is low, they are estimated nowhere to attain an elevation exceeding 300 feet above the sea, and are in general much lower. They possess very little soil, but nevertheless are thickly wooded with spruce, birch, and poplar, on the side towards the mainland; though towards the sea, barren tracts often occur, composed either of bare limestone, or of banks and ridges of limestone gravel.

The coast of the mainland, from St. John river to Mingan river, is of sand and clay, low and thickly wooded, and with a fine sandy beach. Farther eastward the shore is sometimes of granite, and at others of limestone, the latter rock lying immediately over the former. Mount St. John, 1,416 feet high, described in page 211, is the highest point of the mainland in this neighbourhood. There are other hills, rising 1000 feet above the sea, about 18 miles farther eastward, but 6 or 7 miles back from the sea, and nearly opposite Quarry island. With these exceptions, the main is low, and it is particularly so abreast the Eastern islands, where the hills are far back in the country.

Formerly for want of good charts of these islands, they were not much frequented by other than small coasting or fishing vessels, and the danger of the navigation among them has been much exaggerated. With the exception of the dangerous rocks off St. Genevieve and Hunting islands, and a shoal to the westward of Clear Water point, there are no detached shoals outside the line joining the outer points of the islands, nor do the reefs of flat limestone extend farther out from the high water than three-quarters of a mile in any part. The principal channels between the islands, and between them and the main, may be easily navigated with the assistance of the present Admiralty charts, and there are several excellent harbours capable of admitting the largest vessels.

There are twenty-nine of these islands, in none of which are there any inhabitants; some of them are very small, and the largest does not exceed 11 or 12 miles in circumference. They are arranged parallel to the coast, and extend along it 45 miles from St. Genevieve island, at the eastern end, to the Perroquets at the western end of the chain.

Clear Water point, which is 14 miles to the westward of St. Genevieve, projects out so as to interrupt the continuation of the chain of islands, and thus separates them into two divisions, the easternmost of which has been called the Esquimaux islands, a name which should be confined to the island properly so called in the western division. We shall consider them all as the Mingan islands, and treat first of the eastern division.

Supplies of wood and water can readily be obtained from the principal of the Mingan islands; wild berries are abundant in their season, and so

are different kinds of wild fowl. Quadrupeds are scarce, but there are plenty of seals upon the limestone reefs, and a few codfish off the coast.

The TIDES are not strong among the Mingan islands, never exceeding a knot, excepting in very narrow channels. They are often rendered irregular by the winds, but in fine settled weather there is a constant alternation of the streams of flood and ebb between the island and the main, and also within the distance of 2 or 3 miles from the outer, or southern shores of the islands. The time of high water on the full and change days, and the rise of the tides, will be given for the principal harbours.

St. GENEVIEVE, the easternmost of the Mingan islands, is about 5 miles in circumference. Its north-east point is a bluff headland, being the termination in that direction of the highest part of the island, which is about 200 feet above the sea, and slopes irregularly down to the southward.

Mount St. Genevieve is an isolated table hill on the mainland, of limestone, 332 feet above the sea at high water, resting on the granite about a mile inward, and bearing N. ¼ E., rather more than 2 miles from the north-east point of the island. This mountain, and the high north-east point of the island, distinctly point out to a vessel at sea the position of the channel between the island and the main.

SAINTS and BOWEN ROCKS.—There are two patches of rocks which render it necessary to approach the island of St. Genevieve with caution, viz., the Saints, and the Bowen rocks.

The Saints are two low and bare rocks, lying rather more than half a mile to the southward of St. Genevieve. There is a channel carrying 5 fathoms water, but with foul ground, between them and the island; and reefs under water extend from each of them fully 3 cables to the south, south-east, and south-west.

The N.W. Bowen rock, with 3 feet least water, lies 1¼ miles E. by S. ¼ S. from the eastern Saint, and with the south side of the latter on with the centre of the western Saint.

The S.E. Bowen rock, with 6 feet least water, lies S.E. ¼ S. two-thirds of a mile from the north-west Bowen rock, and S.E. by E. ¼ E., 1⅔ miles, from the eastern Saint, which is just open to the northward of the western Saint. These very dangerous rocks lie nearly in a line from the south-east point of St. Genevieve, at the distance of 1¼ and 2 miles, respectively. There is very deep water between and close to them, and also for rather more than a mile to the southward of them and the Saints. The soundings are here extremely irregular, varying from 4 to 6 fathom, rock, to 43

fathoms, sand, sometimes in a single cast of the lead. The whole of this dangerous part should be avoided by vessels.

HUNTING ISLAND, the next westward of St. Genevieve, is low, thickly wooded, broken into many coves, fringed with small islets and rocks on all sides, excepting towards the mainland, and is about 11 miles in circumference. Its longest diameter is parallel to the coast, and about 4 miles. Off its south-west point, and extending to the distance of $1\frac{1}{2}$ miles, lie Wood and Gun islands, leaving no passage between, and having reefs running out from them 3 cables to the southward. They are both low, and the latter is bare of trees, but covered with grass and peat, in which innumerable puffins burrow and rear their young.

GARDE ROCK, always above water, lies rather more than a mile to to the southward, from near the centre of the southern coast of Hunting island; it would be highly imprudent for any ship to attempt a passage between it and the island, as there are many ledges scattered along the southern side of the island, and the Garde is itself the termination of a long ridge of sunken rocks. The south-eastern end of the island is likewise beset with several reefs, some of which extend three-quarters of a mile to the southward.

COLLINS SHOAL, a small patch of rocks, with 15 feet least water, lies South $2\frac{3}{4}$ miles from the south-east point of Hunting island. From this dangerous shoal, the east point of St. Genevieve is just open to the eastward of the western Saint, bearing N.E. $\frac{1}{2}$ N., and the north point of Wood island is in line with the south side of the Garde rock, N.W.

CAUTION.—Between Collins shoal and the reefs off the south-east point of Hunting island, the soundings are irregular, from 4 to 17 fathoms over rocky bottom, and vessels should not pass there, as in such a place it was impossible to be sure of having discovered every point of rock which may approach a few feet nearer the surface than the rest.

ST. GENEVIEVE and BETCHEWUN HARBOURS.—The first of these harbours is situated between St. Genevieve island and the mainland, and the second, between Hunting island and the main. Both are excellent harbours, not difficult of access or egress with the assistance of the Admiralty chart, and fit for the largest ships.

Wood and Water may be obtained; the latter from small streams, either on the main or on the islands.

DIRECTIONS.—There are two channels leading to these harbours; namely, the East, and the Saints channels. The East channel is the best

with easterly winds, and may be used with moderate westerly winds during the flood tide, by vessels not too large to work in such narrow channels, but they must be careful in their boards to the northward, especially in that towards Ledge point.

By EAST CHANNEL.—To enter by the East channel, with an easterly wind.—Being at a distance from St. Genevieve island, of not less than 3 miles, to be sure that the vessel is farther out than Bowen rocks, bring the north-east point of St. Genevieve in one with Indian point, (a low wooded point of the main, forming the east point of Pillage bay,) bearing N.W. by N. Run in with this mark on, and it will lead half a mile to the eastward of the Bowen rocks, and will pass them in between 20 and 30 fathoms water, over a bottom of fine sand and coral.

When the south-east point of St. Genevieve and the west Saint come in one, steer a little to the northward, so as not to go too near a flat shoal, which extends nearly 3 cables from the east side of St. Genevieve. Give the north-east point of St. Genevieve a berth of a cable's length, and passing as close to the shingly north point of that island as is prudent, anchor in 10 fathoms, mud bottom, half way between the latter and Anchor island, which will be seen lying close within the north-west point of St. Genevieve.

The distance across from the north-east point of St. Genevieve to the main is about a mile, but the navigable breadth of the entrance is reduced to half a mile, by the rocks and shoal water off Ledge point, which is composed of numerous rocks of granite close together. The shoal water extends from Ledge point, directly across Pillage bay, to Partridge point, and a vessel must not approach these shoals nearer than 7 fathoms.

If wishing to proceed to Betchewun harbour, instead of anchoring at St. Genevieve, pass to the northward of Anchor island, which is quite bold on that side, and the entrance of Betchewun (between the north point of Hunting island and Partridge point) will be seen bearing W. by N.; Mount Partridge, on the north-east side of the point of the same name, will be easily recognised, being a wooded and steep-sided hill, similar to, but much lower and smaller than Mount St. Genevieve. The north point of Hunting island is also a cliffy mound, with a cove on its eastern side. It is quite bold, and a vessel must pass close to it, to avoid the shoal off Partridge point, which extends a full quarter of a mile to the southward, and diminishes the navigable breadth of the entrance to 3½ cables' lengths. When in the entrance, a low islet will be seen in the centre of the harbour; steer for it, and anchor with it bearing W. by N., and distant one-third of a mile. The depth of water in the harbour is from 9 to 18 fathoms, over mud bottom.

By SAINTS CHANNEL.—To enter these harbours by the Saints channel, bring the west points of St. Genevieve and Anchor islands in one, bearing North, at a distance of not less than 5 miles from the former, to be sure that the vessel is outside of Collins shoal. Run in upon this leading mark, until the north sides of the two Saints come in one, bearing E. by S. ½ S. The east sides of Mount Partridge and of Hunting island (or rather of an island joined to it at low water) will come in one at the same time, bearing N.W. by N. ½ N.; steer upon this last-named leading mark (to avoid a reef which extends 2¾ cables' lengths from the south-west point of St. Genevieve), until the east side of Mount St. Genevieve, seen over the sandy south-east point of Anchor island, comes in one with the north-west point of St. Genevieve island, bearing N.N.E. ½ E. From thence by steering North, it will lead in through the centre of the channel between St. Genevieve and Hunting islands, and the vessel may either proceed to St. Genevieve harbour, round Anchor island, giving its west end a berth of 2 cables' lengths, or to Betchewun harbour along the north-east side of Hunting island, which is bold-to.

The directions just given for the Saints channel will lead a vessel in between the dangers off St. Genevieve and Hunting islands, in not less than 20 fathoms water, and she will not have a less depth until she is in as far as Anchor island. The breadth of the channel between the shoal water off the Saints, and the shoals off the south-east point of Hunting island, is a mile. It diminishes to half a mile between the reef off the south-west point of St. Genevieve and the east end of Hunting island, which is the narrowest part of the channel. Within this narrowest part, the ground becomes good for anchoring, as it is everywhere between St. Genevieve and Betchewun harbours. Indeed, so little sea comes in that the whole space may be considered as a harbour capable of holding a great number of vessels of the largest draught.

There is an inner harbour at Betchewun, to the westward of the low islet which has been mentioned, but from thence there is no channel, excepting for boats, to pass out to the westward between Hunting island and the main.

TIDES.—It is high water, full and change, in Betchewun harbour at 11h. 30m.; ordinary springs rise 5 feet, and neaps 3 feet.

The tides between St. Genevieve and Hunting islands, and the mainland, are much influenced by the winds; but their rates seldom amount to a knot at any time, and are usually much less, excepting through the shallow and narrow channel at the west end of Betchewun harbour, where there is at times a complete rapid.

CHARLES ISLAND, the next westward of Hunting island, is 3 miles long, parallel to the coast, and 1½ miles wide. It is about 200 feet high,

bold, and free from shoals; but at the distance of three-quarters of a mile South from its east point there is a patch of rocky ground on which no less than 5 fathoms have been found, but which had better be avoided by vessels of large draught.

PUFFIN BAY.—The east point of Charles island bears N.W. by W., nearly 2¼ miles from the west point of Gun island. The former of these points is quite bold, and so is the latter to the north-west; but to the south-west it has a reef extending to the distance of 2 cables' lengths. Between them is the entrance to Puffin bay, which is open to southerly winds. Within the east point of Charles island, and half way towards Shoal cove, there is good anchorage in 7 fathoms, mud bottom, at the distance of 2 cables from the island; but the south-east winds send in a considerable swell. In the north-east corner of this bay is the narrow entrance (between shoals off Ragg point and Hunting island) to Ragg bay, which has tolerable anchorage in its north-west part, but has very deep water on the side towards Hunting island, and is separated from the western part of Betchewun harbour by the shoal and narrow channel for boats between the island and the main, mentioned in the last page.

CHARLES HARBOUR, between Charles island and the main, though very narrow is quite secure, and deep enough for vessels of any size, but its entrances are only 160 yards wide. Within, the harbour expands to a quarter of a mile wide by three-quarters of a mile in length, parallel to the shore. Both entrances carry a depth of 7 fathoms, but a vessel must pass over 4 fathoms if she enters from the eastward, through Puffin bay. The depth within the harbour is from 4 to 6½ fathoms, with mud bottom.

Strong winds occasionally cause the tides to run at the rate of 2 knots in the entrances of the harbour, but in general there is only a weak stream with either tide.

TRILOBITE BAY.—Whale island, lying one quarter of a mile from the east side of Ammonite point, and with shoal water between them, is distant 8 cables to the westward of Charles island. Both islands are bold and cliffy, and Trilobite bay is between them with excellent anchorage, well sheltered from all but southerly winds. The only danger to be avoided when working into this bay is a reef off Ammonite point, which includes a small islet, and extends half a mile off shore. The mark to clear this reef, when running along the coast, is to keep Gun island open to the southward of Charles island, and when hauling in from the westward into Trilobite bay, keep the north point of Charles well open to the southward of Whale island.

DIRECTIONS.—To enter Charles harbour from Puffin bay, bring the north east point of Charles island, which is high and cliffy, to bear N.W., then steer for it, and give it a berth of between 1 and 1¾ cables' lengths, as the vessel hauls round it to the westward into the harbour.

To enter from Trilobite bay, give the north-west point of Charles island a berth of between 120 and 280 yards, as the vessel hauls round it to S.E. by E. into the harbour. All the way from the eastern narrow entrance into Charles harbour there is a broad zone of shoal water, which curves round parallel to the mainland till it joins Whale island, and nearly fills up all the north-west part of Trilobite bay, rendering the entrance of the harbour too narrow for convenient or general use.

CLEAR-WATER POINT, about 2 miles westward of Ammonite point, and 2½ miles westward of Whale island, is low, and the shoal water does not extend more than a quarter of a mile off it to the southward. The coast, between this point and Esquimaux point, forms a large bay, along which there are high and conspicuous cliffs of sand and clay, that distinguish this part of the coast to a vessel at sea. The shoal water extends a considerable distance from the shore all around this bay, and abreast Sea Cow island the 3 fathoms line of soundings is a mile out from the sandy beach.

CLEAR-WATER SHOALS.—West, 1½ miles from Clear-water point, lies a rocky 3 fathoms shoal, and there are three others, with 2 fathoms, lying to the northward of the first, and in a line from the point, towards Walrus island; the outer and westernmost of them being rather more than 2 miles from the point.

The mark for the outermost of these shoals is the south side of the high land of Niapisca island in one with the south point of Gull island, bearing N.W. by W. ¼ W.; or the north point of Fright island on with the south side of Esquimaux island, and open to the southward of Green island, bearing N.W. ¾ W. To pass outside these shoals, at the distance of half a mile, keep the south points of Gull and Fright islands in one, bearing N.W. ¾ W.

SEA COW and WALRUS ISLANDS.—Walrus island lies W.N.W. 4 miles from Clear-water point, and Sea Cow island is close to the north-east of it. The two islands together cover the space of 1½ miles in a north-east direction, and are steep and precipitous, excepting to the southward, in which direction the reef off Sea Cow island extends three quarters of a mile, and that of Walrus island 2 cables' lengths.

SEA COW CHANNEL.—There is a clear channel, named Walrus, to the westward of the Sea Cow and Walrus islands, and also between them

and the Clear-water shoals. This latter channel, named Sea Cow, is 1½ miles wide, and, although not the best, may be used in proceeding to Esquimaux harbour from the eastward, by running upon the leading mark which has been given for clearing the shoals to the westward of Clear-water point, until the east side of Esquimaux and Walrus islands come in one. Then steer for the north-east side of Sea Cow island, and haul round it, at the distance of not less than 2 cables to the north-westward for the east entrance of the harbour.

GREEN ISLAND, small, low, covered with grass, with reefs stretching north and south, nearly 3 cables' lengths, but bold to the east and west, lies nearly a mile W.N.W. from Walrus island, and a third of a mile E.S.E. from Esquimaux island.

GULL ISLAND lies W. ½ S. a mile from Green island, which it resembles, excepting that it is rather smaller. It is distant half a mile to the southward from the south-east point of Esquimaux island, but there is no passage for ships between them. The south point of Gull island is bold, and may safely be passed at the distance of 2 cables.

ESQUIMAUX ISLAND, 2¾ miles long, parallel to the coast, and 1¾ miles wide, is 200 or 250 feet high towards its north side, sloping to the southward. From its south-west point a shoal extends towards Fright island, which also has a shoal stretching towards Esquimaux island. The channel between these, leading north-eastward towards Esquimaux harbour (*see* page 199), is nearly 4 cables wide, with very deep water, but as there are no leading marks for it, and the reefs on either side are extremely dangerous, it cannot be recommended.

FRIGHT ISLAND is nearly a mile from the west point of Esquimaux island, and about two-thirds of a mile long, in a north-east direction; it is bold on the south and south-west, on which sides vessels may pass at a cable's length, but reefs extend off it to the eastward, and also off its north-east and north-west points, to the distance of 3 cables.

QUIN ISLAND lies within, or N.E. by N. from Fright island, from which it is distant a short half mile: it is nearly 1¼ miles long, in a N.N.E. direction, and its shores are bold, with the exception of a broad reef running out half a mile to the W.N.W. from its north point.

FRIGHT CHANNEL is deep, but only 2 cables wide, between Quin island and the reefs off Fright island. It cannot be recommended, but might be used in case of necessity with a westerly wind for proceeding to

Esquimaux harbour, by hauling up to the east of Niapisca island till the south end of Quin island comes in one with the south side of the cove in Esquimaux island, bearing E.S.E., then steering so as to pass close round the south point of Quin island, which is quite bold, and thence E. by N., 2 miles to the harbour.

QUIN CHANNEL is the best for vessels approaching Esquimaux harbour from the westward. It is two-thirds of a mile wide between Quin island and Pointe aux Morts, but reefs on either side reduce the navigable breadth to less than half a mile. The depth in this channel is from 5 to 7 fathoms over rocky, gravelly, and sandy bottom. The shoal water extends only to the distance of a cable from the island, but off Pointe aux Morts, and the small islets to the westward of it, the reefs extend to the distance of 2 cables to the southward.

ESQUIMAUX HARBOUR lies between the north and north-east points of Esquimaux island, and between that island and the mainland; the island is 4 cables from Esquimaux point, which bounds the north-east part of the harbour. Esquimaux point, having the entrance of a small river on its west side, consists of sand, and is quite bold to the south-west, although shoals extend from it across the bays on either side, as has been mentioned. The north and north-east points of Esquimaux island are also bold, and may be passed at the distance of 140 yards by the largest ships. The depth within this secure harbour is from 5 to 15 fathoms, over a sandy bottom. The space in which vessels may anchor is nearly $1\frac{1}{2}$ miles long, in a N.W. $\frac{1}{2}$ W. direction, which is the bearing of the points of the island from each other, and the average breadth of the harbour is 4 cables. There is therefore room for a great number of vessels, which, if they anchor well over towards the island, (that is, within the line joining its north and north-east points, and in not more than 11 fathoms water,) will be sheltered from all winds.

Water.—Supplies of good water may be procured from the river at Esquimaux point, or from small streams on the island, and wood is plentiful.

DIRECTIONS.—Brief directions have been already given for Sea Cow, Fright and Quin channels, leading to Esquimaux harbour. We shall now describe the best channels from the eastward and westward.

By WALRUS CHANNEL.—Walrus channel, between Walrus and Green islands, is the best with easterly winds. It is three-quarters of a mile wide, with 8 fathoms least water, and it is only necessary to give either island a berth of 2 cables to be clear of all dangers. Being 2 or 3 miles outside of these islands, bring the north-east point of Esquimaux island

to appear about half-way between the two islands above mentioned as forming the channel, and it will bear about Nortl.. Steer for it, and, giving it a berth of a cable, haul round it to the north-westward into the harbour, and anchor in the depth and position which has been recommended.

By NIAPISCA CHANNEL.—Niapisca channel is the best with westerly winds. Passing in to the northward, between Niapisca and Fright islands, it leads to the entrance of Quin channel, and thence eastward to the harbour. The dangers to be avoided in this channel, besides the reefs off Fright and Quin islands already mentioned, are the reefs of flat limestone extending half a mile out from the south and south-east points of Niapisca island. Between those points, a remarkable group of flower-pot rocks will be seen standing on the limestone just above high-water mark. From the east point of the island, which is the south point of a bay, another reef runs out half a mile to the N.E. by E., but there is ample space between these reefs and Fright island, the channel being over a mile wide in the narrowest part, and carries between 30 and 40 fathoms water.

In running for this channel from the westward, observe that the leading mark for clearing the south reef of Niapisca island by more than 2 cables' lengths is the north-west point of Fright island in one with the south end of Quin island. Do not, therefore, open those islands clear of each other until Moniac island (bearing N. $\frac{1}{2}$ E. $2\frac{1}{2}$ miles from the nearest point of Niapisca) is brought in sight to the eastward of Niapisca. Having done so, haul in through the channel, steering N.N.E. $\frac{1}{2}$ E., and when Moutange island (next westward of Moniac) opens to the northward of Niapisca, the vessel will be clear of the N.E. by E. reef off the east point above mentioned.

Haul up now, if necessary, to clear the reef, which projects half a mile W.N.W. from the north point of Quin island, until the north point of Esquimaux island is not only open to the northward of Quin island, but also the north point of Sea Cow island is open to the northward of Esquimaux island. Run in between Quin island and the main, with the last-named marks just open, bearing about S.E. $\frac{3}{4}$ E., and they will lead past the north point of Quin island, at the distance of about 2 cables.

It must be borne in mind that the mark for the shoals off Pointe aux Morts, and the small islets westward of it, is the north and north-east points of Esquimaux island in one, bearing S.E. $\frac{1}{2}$ E.; if a vessel opens them before she is as far to the eastward as Quin island, she will be ashore.

Having passed Quin island, continue the course towards the north point of Esquimaux island, and haul round it to the south-eastward into Esquimaux harbour.

TIDES.—It is high water, full and change, in Esquimaux harbour at about 0h. 30m., and the rise at springs is 6 feet, and at neaps 3½ feet.

The tides usually run at the rate of about one knot through Esquimaux harbour, the flood coming round Clear-water point from the eastward, and passing to the westward between Quin island and the main. The ebb flows in the contrary direction.

The flood also draws in between Fright and Niapisca islands, and the ebb sets out through the same channel. But these streams are much influenced, both in their rate and duration, by the winds, and the ebb is much accelerated by westerly winds in Esquimaux harbour, running there at times fully 2 knots.

NIAPISCA ISLAND, the reefs of which have been already mentioned, is rather more than 2 miles long, north and south, is only partially wooded, and has three principal hills, not exceeding 200 feet high.

QUARRY ISLAND, nearly 2½ miles long, parallel to the coast, and about the same height as Niapisca, is separated from the latter by a channel nearly 4 cables wide, with a small islet in it, but no safe passage for shipping, because of a shoal in the bay to the southward, and of a reef which stretches beyond the small islet. Other reefs also run out one-third of a mile from the west side of Niapisca, and from the south side of Quarry island.

QUARRY COVE is on the north side of Quarry island, and two-thirds of a mile to the north-westward of the east end of the island. It is about 2¼ cables wide, and 4 cables deep, with 22 fathoms water in the entrance, shoaling gradually to 5 fathoms with mud bottom close to its head. The islands and shoals along the mainland are distant only 3 miles to the northward of this cove, which thus becomes a completely land-locked, though very small, harbour. No other directions are requisite than keeping the west side nearest on board in entering, and to anchor near the centre in 9 or 10 fathoms.

Water.—Good water may be obtained from a small stream in the south-west corner of Quarry cove.

QUARRY CHANNEL.—There is a clear channel between Quarry island and Large island, which is the next westward. This channel is about 4 cables wide from island to island, in the narrowest part, where the shoal water off Large island diminishes the navigable breadth to about 3¼ cables. The only directions necessary are to bring the channel to bear N.N.E., and then run in, keeping in its centre until two-thirds of a mile within the south-west point of Quarry island, after which that island

may be kept close aboard, as the remainder of the channel, 1½ miles, is quite bold on that side, while the shoal water extends to the distance of 1½ cables from Large island. The flood runs slowly in through this channel, and the ebb as slowly out.

LARGE ISLAND, of an oval shape, the longest diameter 4 miles, and lying nearly north and south, is rather more than 11 miles in circumference, thickly wooded, and its highest part is about 200 feet above the sea. Reefs of flat limestone extend off its south and south-west points to the distance of nearly three-quarters of a mile, and the mark for the south point of these reefs, in 2 fathoms, is the south points of Niapisca and Fright islands in one. On its west side, a mile to the northward of its south-west point, there are many flowerpot and arched rocks, standing on the flat limestone above the present high-water mark.

MIDDLE REEF lies just within the line joining the south points of Large and Mingan islands, and 2 miles westward of the former. A part of this reef is always above water, but it is not 60 yards in diameter, though the shoal around it is half a mile long in a N.E. by N. direction, and one-third of a mile wide. From the east side of this reef, in 4 fathoms, the east sides of the two Birch islands are in one.

LARGE CHANNEL, between the Middle reef and Large island, is 1⅔ miles wide, with a depth of 54 fathoms. This is the channel that should be used by a vessel proceeding to Mingan harbour with an easterly wind, and in doing so the only thing necessary to be observed is, that the reefs extend to the westward off the shore of Large island, from 3 to 2 cables' lengths, as far in as the Flowerpot columns, after which the island becomes bold. There is little or no warning by the lead on the Large island side, but the Middle reef may be approached to the depth of 13 fathoms, which, on the east side, is more than half a mile from it.

Farther in, the Birch islands form the west side of this channel, at the distance of nearly 2 miles from Large island; the east side of the Outer Birch is quite bold, and the shoal water extends only 1½ cables off the east end of the Inner Birch island.

OUTER and INNER BIRCH ISLANDS lie to the northward of the Middle reef, and in a line from it towards the west side of Harbour island. The channel between the two Birch islands is 3 cables wide, but the ground is all foul, and not more than 3½ fathoms could be carried through by a stranger. The Outer Birch island is about a mile in diameter, and about 300 feet in height, and it has a remarkable flowerpot rock on its south-west point. The Inner Birch island is rather larger; its north-west point is long and low, extending half a mile to the westward

from the body of the island, with a curve to the south-west; off this point there is a reef running out half a mile to the westward, and having 12 fathoms within the distance of a cable of its edge.

Half a mile south-west from the same point, there is a small low islet, close to the south point of which stands a very remarkable rock, called the Hulk rock, from its resemblance to the hulk of a wrecked vessel. The reef, of flat limestone, dry at low water, which connects this islet and rock to the low west point of the Inner Birch island, extends 3 cables off the rock to the south-west, and also 2 cables to the westward.

MIDDLE REEF CHANNEL, between Outer Birch island and the Middle reef, is almost a mile wide, with a depth of 30 fathoms, and the shoal water extends only 1½ cables from the south point of the former; but there is a dangerous reef off the west side of the Outer Birch island, extending two-thirds of a mile from the shore.

TIDES.—The flood tide sets out to the south-west between the Birch islands, and also between them and the Middle reef.

BIRCH CHANNEL, between the Birch islands and Mingan island, is the best by which to proceed to Mingan harbour with westerly winds. It is 3 miles wide, and all deep water.

MINGAN ISLAND, 3¼ miles to the westward of the Inner Birch island, is nearly 2 miles long in a N.N.E. direction, and, including two small islands close to its west side, nearly a mile broad. It is about 100 feet in height, and bare of trees. The shoal water does not extend above 3 cables off its south point; but to the south-west and west the reefs, including the islets, run out nearly 6 cables. The island is bold on its north and east sides.

MINGAN PATCH lies S.W. ½ S., 3¼ miles from the south point of Mingan island, and with the south point of the Outer Birch touching the north point of Large island; it is a patch of rocky ground, with 9 fathoms water on it, yet there is a heavy swell on it at times. There are 22 fathoms water between it and the island.

The PERROQUETS, the westernmost of the Mingan islands, are four small islets, low, and bare of trees. The north-westernmost is higher than the others, surrounded with cliffs, and has a superstratum of peat on its flat summit, in which great numbers of puffins burrow and rear their young.

The two easternmost of these islets are distant two miles N.W. by W. from the centre of Mingan island, and have a reef of flat limestone extend-

ing off them three-quarters of a mile to the S.S.W. There is also a shoal to the northward of them one-third of a mile, and a narrow channel between them and the other two, but of no use to vessels. The north-westernmost islet has shoal water off it to the distance of a quarter of a mile, both to the eastward and westward, but a vessel may pass to the northward of it, at the distance of 2 cables, in 14 or 15 fathoms water.

PERROQUET CHANNEL, between the Perroquets and Mingan islands, is 1¼ miles wide, and with a depth varying from 30 to 40 fathoms in the centre. Both the flood and ebb set out through the channel, the former to the south-west, and the latter to the southward.

MINGAN CHANNEL.—All the islands just described, from Niapisca island, are bold, and free from danger on their north sides, so that Mingan channel, which lies between them and the main, is safe throughout.

Moniac island, on the mainland side of this channel, is less than half a mile in diameter, and lies nearly abreast Niapisca island, from which it is distant about 2½ miles. Moutange island, 1½ miles farther westward, is about 1¼ miles in diameter, and situated off a bay full of little islets and in which there are several small rivers. Moutange is directly abreast Quarry island, at the distance of 2½ miles. These islands, Moniac and Moutange, are distant three-quarters of a mile from the nearest point of the main, but shoals within and between them are nearly dry at low water.

The shoals do not project above the distance of 3 cables off to the southward of these islands, but there is rocky ground, with irregular soundings between 4 and 10 fathoms, out to the distance of a mile to the southward of them both; so that a vessel beating in the Mingan channel had better not stand over to the northward beyond 1¼ miles from the northern shores of the outer islands, or into less than 10 fathoms.

Between the Inner Birch island and Harbour island, the Mingan channel is 1⅞ miles wide, with rocky and irregular soundings, between 7 and 20 fathoms. The deepest water is over towards Birch island, where the bottom is generally of sand, gravel, and shells.

Between the Perroquets and Long point, and also between Mingan island and the latter, the Mingan channel is 2¼ miles wide, and free from all danger, excepting a sandy shoal which extends off the shore, immediately to the westward of Long point, to within a mile of the Perroquets. There is often a great ripple off this shoal, caused by the flood tide being turned off by Long point towards the south-west. This channel may be conveniently used, in going to Mingan harbour with a northerly wind.

Long point consists of sand, and there is a fine beach from thence to the eastward, as far as Mingan harbour inclusive.

SAND LARK REEF, lying 3½ miles N.W. by W. of Moutange island, 2½ miles E.S.E. from Harbour island, and rather more than a mile from the mainland, is small and low, but always above water. The shoal water does not extend off it above a cable's length, and there is a clear channel with deep water on all sides of it; but there is a rocky patch, with 5 fathoms water, 1½ miles from it, on a line towards the south side of Moutange island. This shoal water has not been particularly examined, and should therefore be avoided.

MINGAN HARBOUR is the narrow and well-sheltered space between Harbour island and the mainland, which last is low and has a fine sandy beach, while the island is of limestone, about 100 feet in height, precipitous and bold towards the harbour, but shelving and shoal to the southward to the distance of a quarter of a mile from the shore. The length of the island is 2 miles, its greatest breadth does not amount to half a mile, and it is thickly wooded.

The reefs off the east and west ends of the island, and which are the principal things to guard against in entering the harbour, extend nearly a quarter of a mile out from the high-water mark.

The mainland recedes from the island in the eastern part of the harbour, which would, in consequence, be exposed to easterly winds, if it were not for a sandy shoal, dry at low water, which extends 7 cables out from the entrance of the Mingan river. This river is only capable of admitting boats at high water, and its mouth is opposite the east end of the island. The eastern entrance of the harbour, between the above sandy shoal and the island, is 2 cables wide, the western entrance between the mainland and the island is 1⅜ cables wide, the whole breadth in both entrances being in deep water. The space within, in which vessels may anchor in safety, is about a mile long by rather more than a quarter of a mile wide, with plenty of water for the largest ships, over a bottom of fine sand.

Although these entrances are so narrow, there is little difficulty in taking a vessel in of the size of a sloop of war, and large frigates have occasionally visited the harbour.

DIRECTIONS.—In approaching Mingan harbour from the eastward, bring the north or inner side of Harbour island to bear N.W. ¼ N., and the houses of the Hudson Bay Company's post ought then to appear open fully their own breadth to the northward of the island. Steer for those houses so open, leaving the east end of the island 1½ cables to the southward, or to port, and taking care to keep the south side of the sandy point of the main, which forms the western entrance of the harbour, shut in behind the north side of the island, for when they are in one the vessel

will be on shore on the sandy shoal off Mingan river. After the east end of the island is passed, run along its north side at the distance of a cable, and choose a berth anywhere near the centre of the harbour, in from 9 to 13 fathoms, sand bottom.

When running for the harbour from the westward, run in towards the sandy beach of the mainland at the distance of three-quarters of a mile to the westward of the island, until the sandy point of the mainland, which forms the west end of the harbour, comes in one with the face of the clay cliffs, to the eastward of the Hudson Bay Company's houses, bearing E. by S., or until the depth is 11 fathoms. Run upon this mark along the beach, and give the above sandy point of the mainland a berth of half a cable's length as the vessel passes into the harbour, and choose a berth as before directed.

Mingan harbour is quite secure in all winds, and, like Esquimaux harbour, it has this great advantage, that vessels can enter or leave it either with easterly or westerly winds.

The BANKS of SOUNDINGS, which extend off the Mingan islands towards Anticosti, have been already mentioned in page 32, and it is only necessary to add here, that their southern edge, in 50 fathoms water, is no less than 5 miles off from the islands, and that the banks become wider, or extend farther off, as we proceed to the westward There is much greater depth of water in some of the channels between the islands than there is on these banks, as will be seen by the chart.

From Long point, a broad beach of fine sand reaches to the river St. John, and the chart will show that an irregular band of shoal water lies outside of this beach, at the distance of three-quarters of a mile.

CHAPTER IX.

GULF AND RIVER OF ST. LAWRENCE, NORTH COAST.—RIVER ST. JOHN TO POINT DE MONTS; AND FROM THENCE TO LITTLE BERGERON COVE NEAR THE RIVER SAGUENAY.

VARIATION 27½° to 19° WEST in 1860.

RIVER ST. JOHN.—This large stream disembogues on the northern shore of the Gulf, at 6½ miles N.W. by N. from the Perroquets, which are the westernmost of the Mingan islands. It is occasionally frequented by fishing-schooners early in the season, and the boats of the *Gulnare* ascended it 6 miles, following the winding of its channels, with a depth varying from 1 to 3 fathoms at low water. The tide flows no farther than the distance just mentioned, where the river becomes too rapid to be navigated by other than canoes or flat-bottomed boats. The course of the river, for several leagues up from the entrance, is between high cliffs of stratified sand and gravel over clay, with small sandy islands occasionally. The country, on either side, is covered with a thick growth of small spruce trees. Five or six leagues from the sea, following the stream, there are reported to be high falls over granite rocks. At the entrance, between the clay cliffs on the west and a sandy point on the east side, the river is 260 yards wide. The breadth increases to nearly half a mile immediately within the entrance, and then decreases again gradually, being nowhere less than one cable wide in the first 6 miles.

There were two log-houses on the west bank, half a mile within the entrance, where a party of men occasionally resided to fish for salmon; and vessels may lie close to them in 2 fathoms at low water.

Bar.—An extensive bar of sand, half a mile out from the entrance, shifts with every gale of wind, and has seldom more than 3 or 4 feet over it at low water; at high water there are 7 or 10 feet on the bar, according as it may be neap or spring tide. Southerly and westerly winds cause so heavy a surf as to render the bar impassable.

ANCHORAGE.—There is good anchorage outside the bar, which may be safely approached by the lead, the soundings decreasing gradually from 20 to 3 fathoms over sand and clay bottom; the greater depth being at 2½ miles, and the lesser at three-quarters of a mile, from the river's mouth.

TIDES.—It is high water, full and change, at the entrance of St. John river, at 1h. 20m.; ordinary springs rise 7 feet, and neaps 4 feet.

ASPECT of COAST.—From the river St. John to the river Moisic the course is W. by N. ¼ N., and the distance 69 miles. The whole of this long line of coast, with the exception of its two extremities, that is to say all between Magpie and Trout rivers, is composed of primary rock rising immediately from the sea in steep, although often rounded hills, which are either bare, or partially wooded with small trees of the pine species. The hills in front, or next to the sea, seldom exceed 200 or 300 feet in height: but others, a short distance back from the shore, form a range of greater elevation, varying from 500 to 700 feet, and nowhere exceeding 1,000 feet of height above the sea.*

The appearance of this coast from a vessel is slightly undulating, bold and unbroken, presenting features so little diversified that it is very difficult to make out one part of it from another at a distance of 2 or 3 leagues; but upon a nearer approach, the mouths of the rivers, taken in connexion with the features of the neighbouring land, will in general supply distinguishing characters, by which the situation of a vessel may be ascertained.

LOCAL ATTRACTION of the SHORE.—The black oxide of iron, besides being a constituent mineral in the granitic rocks of this coast, is found abundantly in nests and veins, particularly in the vicinity of the Sawbill river. Its magnetic action on the needles of compasses on shore is such as to cause the variation obtained by them to vary from 14 to 29 degrees West. While sounding in the boats, this disturbing influence has been sensibly felt, which diminished or increased as the boat receded from, or approached towards the shore. In the *Gulnare*, at the distance of 2 or 3 miles, the error from this cause never exceeded half a point, and at the distance of 5 or 6 miles it became insensible.

CAUTION.—This coast is not by any means so bold as it appears from a distance, for there are many rocks along it both above and under water, several of which are very dangerous, and nearly a mile from the shore.

There are soundings off every part of this coast, as will be seen in the chart; but strangers should not approach the shore between Magpie and Bason rivers nearer than the depth of 20 fathoms. Still greater caution becomes necessary between the last-named river and St. Charles point, where 40 fathoms is as near as a large ship can approach with prudence, for that depth in several places will be found within a mile of the rocks.

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* *See* Charts:—Gulf of St. Lawrence, No. 2,516; scale, $d = 3{\cdot}7$ inches: and Gulf of St. Lawrence, Sheet 4, No. 306; scale $m = 0{\cdot}25$ of an inch.

MOUNT ST. JOHN, an isolated, saddle-backed hill, 1,416 feet above the sea at high water, bears N.E. by N., 11 miles, from the entrance of the river St. John.

Between the St. John and Magpie rivers the coast consists of white clay cliffs, with a superstratum of sand, which is fast consolidating into sandstone by means of the red oxide of iron furnished by numerous small streams.

MAGPIE RIVER, the entrance to which is nearly in the centre of Magpie bay, and 5 miles N.W. ½ N. from the St. John, is a large and rapid stream, with several rocks above and under water off its east point of entrance, and one-third of a mile off shore.

The entrance of this river, between steep rocks, is only 60 feet wide, and the ebb tide rushes out of it in a torrent 5 fathoms deep. At 1½ cables lengths within this narrow entrance the river falls about 30 feet over granitic rocks. There are from 7 to 9 feet at low water over the bar outside, but as this river is of no use either to vessels or boats, it is unnecessary to describe it farther.

MAGPIE BAY.—Rather more than three-quarters of a mile to the westward of the Magpie river, and nearly one-quarter of a mile off shore on the west side of Magpie bay, there is a rocky shoal, on which the sea almost always breaks at low water.

The course and distance across Magpie bay, from the river St. John to Magpie point, is W.N.W. 8 miles. There is good anchorage, with winds off the land, in the bay; and vessels may stand in to 7 fathoms at low water in every part of it, but the southerly and westerly winds roll in a very heavy sea.

FOUR-FATHOMS RIDGE.—Three and a-half miles W. by N. ½ N. from Magpie point, is Ridge point, from which a long and narrow ridge of rocky ground, with from 4 to 6 fathoms at low water, extends 4½ miles to the westward across a bay, wherein there is one large and several small rocks above water. The western side of this rocky ground is nearly 1 mile off to the southward of Thunder point. There is a very heavy sea upon this ridge at times, and it then becomes dangerous to large ships. There are 20 fathoms water close outside of it in some parts, and 30 fathoms is quite near enough to its west end.*

SAWBILL RIVER, situated in the bay between Sheldrake and Ore points, and 23½ miles westward of the river St. John, may be distinguished by the clay cliffs immediately within the entrance, and by the peculiar

* *See* Chart:—Gulf of St. Lawrence, Sheet 5, No. 307; scale, *m* = 0·25 of an inch.

hills on either side of it, which are barren and of gray felspar, thickly studded with small round mounds.

This river affords shelter to boats and small coasting craft; but it can only be entered in very fine weather, in consequence of the heavy surf. It has scarcely any bar; but the entrance, at the western extremity of a long and narrow spit of sand, which extends across the river's mouth, is very narrow, with a depth of from 4 to 11 feet in it, according to low or high water, in ordinary springs. At high water neaps there is seldom more than 9 feet. The same depth continues only for a very short distance within the entrance.

COD BANK.—Nine miles S. by E. from the entrance of the Sawbill there is a bank of sand, gravel, and broken shells, on which codfish abound, and the depth is upwards of 60 fathoms between it and the shore.

SHALLOP RIVER, 7½ miles farther to the N.W. by W., affords shelter only to boats, and can only be entered when there is no surf. There are several rocks, both above and under water, off this river, and also off Sandy river, a small stream about 2½ miles farther westward. The outermost of these rocks lie fully half a mile from the shore.

MANITOU RIVER, at 4½ miles N.W. by W. of Shallop river, is the largest on this coast, excepting the rivers St. John and Moisic, and is distant to the westward, from the first of these rivers, 35 miles. It may be readily distinguished from a vessel several leagues off the coast by two remarkable patches of clay cliff, one of which is close to the eastward, the other about 1 mile to the north-westward of its entrance.*

To enter this river, keep close along the rocky west side of Manitou point, leaving on the port side the sandy spit close within it, which stretches out from the sandy west point of the entrance. The channel is always in this position, but it is more or less deep and wide according to the season and the winds which may have recently prevailed. In general the channel is about 60 yards wide, with a depth of 5 feet in it at low water, whilst at high water 9 feet in neap tides, and 12 feet in spring tides, may be carried in. Strong southerly and westerly winds cause a heavy surf, and render the entrance impracticable. A short distance within the entrance there are 9 feet at low water, deepening gradually to 5 fathoms at the first rapid, one mile up the river. Half a mile farther up, the river falls 113 feet perpendicularly, over sienite and porphyry, in one unbroken sheet of water, forming one of the most beautiful cascades in Lower Canada.

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* *See* Plan of Manitou river, scale, $m = 4$ inches, on Admiralty Plan of the Bay of the Seven Islands, No. 1,135; scale, $m = 1$ inch.

ANCHORAGE.—There is good anchorage off the Manitou river. Vessels may safely anchor in fine weather with the wind off-shore, having the entrance of the river bearing N.E. ½ E., 1½ miles, where they will have 15 fathoms over mud bottom, and be more than one mile distant from Manitou point, the nearest point of the shore. If water be required it will be found at a small stream on the western shore, a short distance within the entrance; or the boats may row up the river until they find the water fresh.

Small vessels may anchor farther inshore to the westward of the bar, and in the bay between Manitou and Buchan points, which are 3 miles from each other; for the soundings decrease regularly in towards the shore, with sand and clay bottom, and there is no other danger but a small rocky shoal which bears W. by N., 2¼ miles, from the entrance of the river, S.E. ½ S. nearly a mile from Buchan point, and which is about three quarters of a mile off-shore. There are 7 fathoms within this shoal, and 9 fathoms close outside of it, so that it should be guarded against by vessels beating along the coast.

Buchan and Fall rivers, and also Hotteurs river, fall in cascades into the sea, or close to it, and thus serve to point out to a vessel her position off the coast; and there is, moreover, a remarkable white patch close to the westward of Buchan river.

BASON RIVER, which is 10¾ miles W.N.W. from Manitou river, has a spit of large stones extending about 1½ cables' lengths out from its east point of entrance. The entrance is very narrow, with a varying depth, which is less or more according to the prevalence or infrequency of the south-west winds; but there is in general enough water for very small coasting craft or large boats. There are rapids a quarter of a mile within the entrance.

CAPE CORMORANT, at 1¼ miles to the westward of the Bason river, is a small peninsula, on the inner side of which there are the log huts of a trading post not always occupied, and which cannot easily be seen from the sea.

BLASKOWITZ POINT lies 5¾ miles W. by N. ¾ N. from Cape Cormorant. Between them are the Cormorant islets, joined to the shore at low water, and not readily distinguishable from the main land.

CORMORANT REEF, which is small and dangerous, lies off the Cormorant islets, and about a mile from the shore. It has 12 feet least water, and bears W. ½ N., 2½ miles, from Cape Cormorant. When on it, Blaskowitz and St. Charles points are in one, bearing W.N.W. nearly, so that vessels approaching this part of the coast should keep the latter point

open. The coast between Cape Cormorant and St. Charles point is broken into coves, two of which are nearly a mile deep, full of rocks, and afford shelter only to boats. The shore is here fringed with rocks both above and under water, and should not therefore be made too free with.

ST. CHARLES POINT will readily be known by the cove on its eastern side, and by the trending of the land on the west side northward towards Trout river.

ST. CHARLES REEF, lying off St. Charles point, is extremely dangerous, being so bold that there is no warning by the hand lead, and very little with the deep-sea lead. It is composed of a great number of rocks near to each other, but having a considerable depth of water between them. Some of them always show, but the outermost patches are always covered. These last lie rather more than three-quarters of a mile to the S.S.W. from the southern extreme of St. Charles point; and the reef continues to the first cove, 1½ miles to the north-westward of the point, but does not there extend so far off-shore as off the point itself.

CAUTION.—Vessels beating to the westward should take care not to be becalmed to the westward of the St. Charles reef, lest the heavy swell from the south-west, so frequent on this coast, should heave them towards the reef, for the water is too deep to anchor until close to the breakers.

MOISIC BAY intervenes between St. Charles point and the Moisic river; the course across it is West, and the distance 11 miles, with a depth of between 50 and 60 fathoms nearly all the way. Trout river, a small stream, is in the centre of this bay, and 6½ miles N.W. ½ W. from St. Charles point. Here the rocky shores terminate, and the bold sandy beach, which extends 6½ miles S.W. by W. to the river Moisic, commences.

Seal House Cove, on the east side of Moisic bay, and 2½ miles from St. Charles point, affords shelter only to boats. There are two log-houses there, which are occasionally occupied as a fishing and trading post.

The soundings are regular in the bay, with deep water, over clay and sand bottom.

The granitic hills, which leave the shore at Trout river, continue inland until they join the ridges in rear of the bay of Seven islands. Between the hills and the sea there is an extensive tract of low sandy country, thickly wooded, and which seems to have been formed, in the course of ages, by the united action of the rivers and the sea.

RIVER MOISIC enters the sea on the east side of Moisic point, which is the southern extremity of the sandy country just mentioned. It is a larger river than the St. John, discharging a great quantity

of water in the spring after the melting of the winter snows, and bringing down from the interior great quantities of sand, which so obstruct its wide and shallow channel in the first 2½ miles from the sea that boats cannot ascend at low water.*

The river becomes shallow immediately within the entrance, expanding into a wide place full of sand-bars dry at low water. In the above-named distance from the sea, the breadth of the river decreases from 2½ miles to half a mile, and at the end of that distance the sand-bars cease. The river has then a clear channel, carrying 9 feet water, between steep sandy shores or cliffs for one mile farther, where its breadth is a quarter of a mile. Here the examination of the river was terminated by a head-wind and the rapidity of the current, in the spring of the year. The traders report that flat-bottomed boats can ascend to the first rapids, at the distance, following the stream, of six or seven leagues from the sea. The bar, which is of sand, dry at half tide, runs out from the long, low, and narrow east point of entrance, nearly half a mile to the south-westward, and nearly parallel to the east side of the west point of entrance.

The entrance of the river, between this bar and the west point, is from the south-west, and continues for the distance of 6 cables with a breadth of a quarter of a mile, and a depth varying with the seasons and the winds which prevail; those from the southward and eastward having a tendency to block up the channel. It is supposed that there is seldom a less depth than 9 feet at low water, the same as inside, close under the west point of entrance, which is the only place where a small vessel can find shelter, close to two log-houses, occasionally employed as a salmon fishery by the people of the Hudson Bay Company. The shelter here is extremely imperfect in gales of wind from the southward and eastward, which send in so heavy a sea that, after breaking completely over the bar and across the entrance, it still retains power enough to seriously affect a small vessel.

TIDES.—At the entrance of the Moisic it is high water, full and change, at 1h. 30m., and ordinary springs rise from 5 to 8 feet.

MOISIC SHOAL.—Although the bar of the river Moisic is so bold that there are 50 fathoms water at the distance of three-quarters of a mile from it to the South and S.E., yet the shallow water continues from it to the westward 3½ miles past Moisic point, in such a manner as to form an extensive triangular sandy shoal, with from 3 to 1½ fathoms on it at low water.

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* *See* Plan of the Bay of the Seven Islands, No. 1,135; scale, *m* = 1 inch.

MOISIC ROCK, near the south-west extremity of the Moisic shoal, and in 3 feet least water, bears W. by S. ½ S., 2¾ miles from Moisic point, and is nearly 1¾ miles from the shore. This is an extremely dangerous shoal, being as bold as a wall. There are 25 fathoms water alongside of its south and south-west edges, and upwards of 30 fathoms at the distance of 2 cables' lengths. It can generally be seen, in fine weather, from the change in the colour of the water, and from heavy breakers when there is much sea running.

There is no close leading mark for avoiding this shoal, so that the only direction that can be given to a vessel standing towards it, is to tack when the northern side of the Manowin island comes on with the southern point of the Great Boule island: she will then be 1¾ miles from the edge of the shoal, and in upwards of 30 fathoms water.

EAST ROCKS, which are low, bare of trees, and always above water, lie in Boule bay, between the Moisic shoal and the Boule islands. They are out of the way of vessels, but they ought not to stand into this embayed place, since there is generally a heavy southerly swell rolling in, which would render it difficult to beat out.

The south point of Great Boule island bears West, and is distant 9½ miles from Moisic point.

SEVEN ISLANDS are high and steep, of primary rocks, very thinly wooded, and can be made out from a distance of 7 or 8 leagues, being unlike anything else in the Gulf. The easternmost of these islands are the Great and Little Boule, the former of which is the highest of them all, its summit being 695 feet above the sea at high water. Next, westward, and parallel to these two, are the Little and Great Basque islands; the first-named being, as before, the outer island. Great Basque island is 500 feet high. Manowin and Carousel lie to the south-west of the Basque islands; the former island is 457 feet high; the latter much lower, and the southernmost of the islands. The West rocks lie between Manowin and the peninsula, which forms the west point of the bay of Seven islands. They are too small and low to appear as the seventh island; but the peninsula has that appearance when seen at a distance from sea, being higher than any of the islands, and 737 feet above the sea at high water.

CAUTION.—The narrow passes between the two Boule islands, the two Basque islands, between Manowin and Carousel, and between Manowin and the West rocks, require no farther notice than to remark, that the tide sets strongly towards and through them; the flood to the west, and the ebb to the eastward, a circumstance that should be attended to when

becalmed at night, or when tacking in their entrances. The first and last of these channels have water enough for the largest ships; but the one is subject to sudden and baffling flaws of wind round the Boule islands, and the other is rendered intricate by rocks which nearly cover at high water.

SEVEN ISLANDS BAY.—The relative situations of the Seven islands, their size, and the breadth of the channels between them, will be best seen from the charts; they are so placed as to completely shelter the magnificent bay within them which is 2¾ miles wide at the entrance, between Chassé point, the east end of the peninsula, and Sandy point, which is opposite the northern end of Great Basque island. From the entrance Seven Islands bay extends about 6 miles to the northward and westward, being so nearly landlocked as to resemble a lake, sufficiently extensive for the largest fleets to lie in safety; the bottom is of clay, and there are no shoals, excepting the mud banks, which fill up the northern part of the bay.

A fine, broad, bold, sandy beach extends for 3 miles northward from the east point of the bay, to the entrance of the principal river, near which stands the Hudson Bay Company's trading post. The houses at this post cannot be seen from the outer parts of the bay, but there is a wooden store on the beach, off which vessels usually anchor. Water can be obtained from this river at high tide.

To the northward of the bay, at the distance of a few miles, there are two parallel ranges of mountains; the summits of the nearest are upwards of 1,300, and those of the most distant upwards of 1,700 feet above the sea. These mountains, the high peninsula, the bold and hilly islands, and the other features around the bay, form a panorama of great beauty.

ANCHORAGE.—The best berth for a vessel of large draught to lie at anchor in Seven Islands bay is with Sandy point and the north side of Little Boule island in line, and Chassé point in line with the west side of the West rocks. The north-west extremity of the sandy beach near the entrance of the river will then bear N. by E. ½ E.; the vessel will be in 9 fathoms at low water, over clay bottom, nearly 1 mile from the sandy beach to the eastward, and nearly three quarters of a mile from the 3 fathoms edge of the shoals, which occupy the northern part of the bay. Smaller vessels may lie closer to the shore, in 6 fathoms at low water, which is as near as any vessel ought to anchor.

In this anchorage there is a considerable swell with a strong southerly wind, but never enough to endanger a vessel, although sufficient to prevent boats from landing. Those that may wish to lie quite smooth may anchor

in the south-west part of the bay, in 13 fathoms, soft clay bottom, where they will be quite landlocked.

CHANNELS into SEVEN ISLANDS BAY.—There are three channels leading into Seven Islands bay, namely, the East, the Middle, and the West channels.

The East channel between Great Basque island and Sandy point, is seldom used, having a rock in its centre, which is covered only in high tides. A reef, with from 6 to 9 feet of water, extends for a quarter of a mile to the eastward of this rock. The passage on either side of it is 2 cables wide, and carries from 13 to 15 fathoms. Vessels should only attempt it with a fair wind, and should keep within a cable's length of Basque island, or as near to the sandy point of the main land: the latter is recommended as preferable.

This narrow eastern channel may be approached from between the Boule islands and the East rocks, or from between the Boule and Basque islands, both routes being entirely free from danger, for the islands are so bold that a vessel may approach them within a cable's length in every part.

The Middle channel (which is also the principal and best) is upwards of $1\frac{3}{4}$ miles wide, and so free from danger that a vessel of the largest draught may approach the shore within half a cable's length in every part, excepting at Chassé point, where a reef runs out $1\frac{1}{4}$ cables from the shore. This channel, between the Basque islands on the east, and Carousel, Manowin, the West rocks, and the peninsula on the west, is preferable in every wind, excepting the North and N.W., with which, to save beating, (since they blow out of the bay,) it might be desirable to enter by the West channel.

The West channel between the West rocks and Croix point, at the southern extremity of the peninsula, is three-quarters of a mile wide, and quite free from danger. There are 2 or 3 rocks lying a cable to the northward of the islets, called the West rocks, but they always show, excepting in very high tides and the smoothest sea. The only direction necessary, therefore, is not to go nearer to the West rocks than 2 cables' lengths; the peninsula side is quite bold. There is, however, a caution necessary here respecting the ebb tide, which is turned off by Croix point towards the West rocks, a circumstance which must be attended to in taking this channel with a scant northerly wind.

DIRECTIONS.—There are no leading marks for the above channels, nor are any required, for the two last described are so free from danger that a person who had never seen them before might take the largest ship

into Seven Islands bay, without either chart or pilot, by simply giving the shore a berth of 2 cables' lengths in every part.

The water is too deep for anchoring in any of these channels, and the bottom generally rocky, excepting to the eastward and northward of the Boule islands. The ground is not fit for anchoring until well into the bay. The water is extremely deep outside of these islands, and they are so bold that a vessel may stand in close to their rocky shores.

TIDES.—It is high water, full and change, in Seven Islands bay, at 1h. 40m.; springs rise 9 feet; neaps, 5 feet.

The rate of the stream of the tides in the bay, and in the principal channels between the Seven islands, seldom amounts to a knot; but in the narrow channel between the Boule islands, the Basque islands, and in the East and West channels, it may amount to 2 knots in spring tides, or even more in the narrowest of these channels when accelerated by strong winds. The flood, coming along from the eastward, strikes the Boule islands, and passes between them, and also between the two Basque islands. It is turned off by the Great Boule towards Carousel island and the West channel; but the greater part of the stream, which passes within the Boule islands, enters the bay by the East channel, between the Great Basque island and the main land. There is very little flood in the Middle channel, excepting an eddy *outward* stream close along the shores of the peninsula, and the narrow stream from between the Basque islands, which sets across towards the West channel.

The ebb sets fairly out of the bay, part of it by the East channel and part of it by the Middle channel, where it meets the stream through the West channel, which turns it to the eastward, past the southern points of the Basque and Boule islands.

WINDS.—In fine nights the winds are almost always light and baffling between the Seven islands, particularly if the wind be from the westward in the offing. At such times there is generally a northerly land wind in Seven islands bay, but it does not often reach far out among the islands in the early part of the night, although it often does towards the morning.

ASPECT of COAST.—The course from the south-east point of Carousel, the southernmost of the Seven islands, and Point de Monts lighthouse, is S.W. by W. $\frac{3}{4}$ W., and the distance 60 miles. The coast between these points is less bold in appearance, being less elevated, than that to the eastward of the Seven islands. The hills are, for the most part, far back in the country, and the shores are of very moderate height above the sea. The country near the sea is formed of small and low granitic hills, partially wooded with spruce trees. Marshes and ponds are frequent

between the hills; sandy beaches occur occasionally, and the sandy tracts in rear of them are always the most densely wooded parts.

There are no detached dangers off this coast, which is much more bold than its appearance would promise; and although the water is deep off every point of it, yet in general, and with few exceptions, there are sufficient soundings with the deep-sea lead to give warning to a vessel of her approach to the shore.

The course from Carousel island across St. Margaret bay to St. Margaret point, is W. by N., 14 miles; with deep water all the way.

ST. MARGARET RIVER disembogues nearly in the centre of St. Margaret bay, being 6 miles N.W. by W. from Croix point. Although a large stream, it affords shelter to boats only. It has a bar of sand extending three-quarters of a mile out from the entrance, and having several small channels through it, with only 3 feet at low water. Immediately within the entrance, which is $1\frac{3}{4}$ cables wide, there are 6 feet water, and only 3 feet can be carried up to the low falls, which are over granitic rocks, and $3\frac{1}{4}$ miles from the entrance. Below the falls, the river flows between cliffs of sand and clay, and is full of sand-bars, dry at low water. The water deepens gradually outside the bar, with sandy bottom, to 18 fathoms at the distance of a mile from the 3 fathoms line of soundings. There is a sandy beach for a considerable distance on either side of the river's mouth.

ST. MARGARET POINT is rocky, of moderate height, and has a round hill a short distance within its extremity. There are several rocks, which cover at high water, and which extend to the distance of nearly one-third of a mile off this point. These rocks are extremely bold, and there is no bottom with the hand lead close outside of them, and no bottom with 70 fathoms of line at a less distance than 2 miles.

The course and distance from St. Margaret point to Great Cawee island is S.W. by W. $\frac{3}{4}$ W., 16 miles, across a bay in which are Rock river and many other small streams. The coast in this distance is low, and fringed with small islets and rocks close to the shore, which may with prudence be closely approached by the lead, but the depth of 20 fathoms is near enough to it for a stranger. The deep sea soundings are very irregular off this section of the coast, for in some parts there are not more than 50 fathoms 4 or 5 miles off shore; whereas in others, as off the May islets, 6 miles north-eastward of the Cawee islands, no bottom will be found with 60 fathoms within 2 miles of the rocks.

CAWEE ISLANDS are two small and hilly islands of grey granite, and nearly bare of trees. Great Cawee island, which is the largest, the

highest, and the most eastern, is about three-quarters of a mile in diameter, and about 250 feet high. Little Cawee island, lying a mile farther to the south-westward, is composed of two contiguous islets, which occupy a length of half a mile parallel to the coast; it has several rocks above water close off it to the south-west, and a reef 1¼ cables' length to the north and north-west of its west point.*

Water.—There is neither wood nor water in the Cawee islands, but both may be obtained from the opposite main land.

Cawee Rock, small, round, and high, and distant a quarter of a mile to the south-west from the south point of the Great Cawee, is the only danger outside of the islands, and, like their southern sides, is so bold that a large ship might lie alongside of it.

Great Cawee Cove, on the north-east side of Great Cawee island, is secure for boats, with plenty of water, but too small and narrow in the entrance for vessels.

Great Cawee Shoal lies off the mouth of the cove, 2 cables distant to the north-east. The least water is 15 feet, and from it Great Cawee and the point of the main land to the westward appear touching and bearing W. by S. ½ S.

Cawee Ledge.—Half a mile N.E. by N. from this shoal is a small round ledge, awash at low water, and one-third of a mile from the main land. From it the south side of the Large rocks, between Great Cawee and the main, is in one with the point of the main to the westward; and the south side of Little Cawee is just shut in behind the north side of Great Cawee island.

Large Rocks.—At the distance of 2 cables from Great Cawee, between it and the main, there are two large rocks close together; they lie 1½ cables from the mainland, and have a reef extending 2 cables to the S.W. by W. from their south-west point. Nearly half a mile N.E. by E. from these rocks, and at the same distance from the main, there is a small rock which always shows.

ANCHORAGE.—There is anchorage in the mouth of the bay on the inner or north-side of Great Cawee island, in 7 fathoms muddy bottom, and at the distance of a cable's length from the island. The shelter is complete with winds from W. by S., round northerly, to N.E., and tolerably so with all easterly winds, although some swell rolls round the island; but the south-west winds blow right in, and send in a very heavy sea.

DIRECTIONS.—To run into this anchorage from the eastward, steer N.W. past the north-east side of Great Cawee island, going no nearer

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* *See* Plan of Cawee Islands and Egg Island, No. 1,149; scale, m = 1½ inches.

than half a mile (to avoid the shoal off the mouth of the cove), until the point of the main land to the westward opens clear of the north side of the island. Then steer for the point of the main land, keeping it midway between the north side of the island and the large rocks to the northward of it. Having arrived between the rocks and the island, haul into the mouth of the small bay, which will be seen on the north-west side of the latter, and anchor in 7 fathoms at low water. There are 12 or 13 fathoms in the middle of the channel, and upwards of 9 fathoms can be carried through.

In running for this anchorage from the westward, a vessel may pass between Little Cawee and the main, by keeping in mid channel; but the better and safer way is to run between Little and Great Cawee islands, hauling close round the west point of the latter into the anchorage. By this route there is nothing in the way, excepting the Cawee rock, which can always be seen.

From the foregoing description it will be seen that this is a very dangerous and intricate place; and the anchorage between Great Cawee and the main is too small for large vessels, the channel being only 2 cables wide. Still this anchorage, although too small for an occasional place of shelter, excepting for small vessels, may, nevertheless, be of great use as a place of refuge for a vessel in distress, from loss of masts, or other cause; for the ground is so good that a vessel well moored there might be able to ride out any gale which occurs during the summer months.

TIDES.—It is high water, full and change, at the Cawee islands at 1h. 50m.; springs rise 9 feet; neaps 5 feet. The tides run fair through between the islands and the main land, at a rate which seldom exceeds 1½ knots, and which is in general much less.

LOBSTER BAY.—Sproule point, three-quarters of a mile to the north-westward from Little Cawee island, is the eastern point of Lobster bay. A reef extends off its south side, a cable's length towards Little Cawee, but the principal reef off it runs out 4 cables to the south-west.

Lobster bay is between Sproule point and the Crooked islands, which are a group of small islets and rocks, running out from the shore 3 miles to the westward of Sproule point. All the north-eastern part or head of Lobster bay is occupied by an extensive flat of sand and boulders, dry at low water, and on which lobsters abound; but it is an excellent open roadstead, with plenty of room for the largest ships.

The Crooked islands are bold to the southward and eastward, leaving the mouth of the bay clear of all danger across to the reef off Sproule point. Vessels may anchor midway between the reef and the islands, choosing their depth from 5 to 12 fathoms, according as they may wish to lie at

the distance of half a mile, or of one mile from the 3 fathoms edge of the flats in the head of the bay. The bottom is of fine sand over clay, and the shelter from S.W., round north, to East, but all winds from East, round south, to S.W. blow right in, with a heavy sea and thick weather.

PENTECOST RIVER enters the sea on the south-west side of a rocky point, 1½ miles to the westward of the Crooked islands; the opposite point of entrance is of sand. Two miles S.W. from the mouth of the river there is a remarkable round and wooded hill. The first reach of the river is towards this hill, leaving a very narrow sandy ridge between it and the sea. Steep cliffs of sand and clay form the river's banks for 2½ miles, to which distance only it is navigable for boats. The entrance of the river is only 30 yards wide, with a depth of 7 feet at low water, and there are 9 feet within for a short distance. At high water from 12 to 16 feet can be carried in, so that this river is capable of affording shelter to coasting schooners as well as boats; but it would be very difficult to take a sailing vessel in through so narrow an entrance, and could never be done on the ebb tide, which runs out with great rapidity.

A fine bold sandy beach extends from this river to English point, a distance of 7 miles to the S.W.

ENGLISH POINT, at 1½ miles to the northward and eastward from the north rocks of Egg island, has a shoal of large stones extending off it to the distance of one-third of a mile. On the south-west side, or towards Egg island, this shoal may be approached to the depth of 6 fathoms at low water, but on the south-east and east it is very bold, there being 15 fathoms at the distance of one-third of a mile, and 30 fathoms at the distance of a mile from the 3-fathom line of soundings.

EGG ISLAND bears from the south point of Great Cawee island S.W. ¾ W., 14 miles. It is low, narrow, and of granitic rocks, without trees, and three-quarters of a mile long, in N.N.E. ½ E. direction. The North rocks, always above water, lie 4 cables distant from the island to the N.N.E.; they form a low, narrow, black reef, which is 3 cables long, in the same direction, bold towards the mainland and also towards English point, from which they are distant 1½ miles. A reef under water runs out from these rocks in the direction of their length to the S.S.W., and to the distance of a quarter of a mile, leaving only a very narrow 3 fathoms channel between them and the island.

The N.E. reef runs out to the distance of 6 cables from the north-east point of Egg island, and is the greatest danger between the Seven islands and Point de Monts. Some of the rocks upon it show in

low tides, and the sea generally breaks on them at low water. This reef prevents the swell from rolling in between the north rocks and Egg island, and thus assists in sheltering the anchorage.

Water.—There is no water on Egg island, but it may readily be obtained from small streams on either side of Roadstead point.

ANCHORAGE.—Egg island and its rocks and reefs form a natural breakwater, which is 1¾ miles long, in a N.N.E. direction, and inclines slightly towards the shore at its northern end, in such a manner as, with the assistance of the shoal off English point, to shelter the anchorage from north-east winds. The northern end of this breakwater is distant from the mainland nearly three quarters of a mile, and the southern end more than a mile; but extensive flats extend from the main, and diminish the navigable breadth of the channel to about a third of a mile in the narrowest part, which is nearly opposite the northern end of Egg island. The best anchorage is, however, to the S.W. of this narrow part, where the breadth, from the 3 fathoms edge of the shoal off the main to Egg island is 6 cables' lengths.

All along the inner sides of Egg island and of the North rocks, excepting near their northern end, the water is deep, there being from 17 to 24 fathoms at low tide close to them. The soundings decrease gradually towards the main land, and the best depth to anchor in is 9 or 10 fathoms, according to the time of tide. The bottom is of clay in the deep water towards the island, and of sand from the depth of 9 fathoms towards the main land. There is little danger of dragging an anchor up hill towards the main, but, with violent squalls off the land, vessels should have a good scope of cable out, for should the anchor start, they might be on the rocks before they could bring up again.

In order to have as much room as possible, with a moderate depth of water, vessels should not anchor to the north-eastward of a line joining Roadstead point and the centre of Egg island. The best position is with the south-west end of Egg island bearing S.E. by S., and the inner side of the North rocks N.E.; English point will then be open half a point to the westward of the latter. In this anchorage vessels will lie sheltered from N.E., round by north, to S.W. by the main land, and from S.E. to N.E. by the island, with its rocks and reefs. The winds from the remaining points, namely, those between S.W. and S.E., seldom blow strong, and even with them a vessel may find some shelter by shifting her berth to the eastward, where she will find 7 fathoms over sandy bottom.

The anchorage at Egg island is too small to be a favourite resort for large vessels, but in time of need, or as a place of refuge in case of distress, it would be found of great value on a coast so destitute of good harbours.

DIRECTIONS are unnecessary for running into this anchorage from the southward and westward, since the south-west end of Egg island is quite bold. But if it be intended to run through between the island and the main, stand in to the northward to 8 or 9 fathoms, or until English point is open half a point to the northward of the North rocks, then steer for English point, giving the inner side of the north rocks a berth of a cable's length, until the vessel has passed the North rocks a full quarter of a mile. She will then be in about 7 fathoms at low water, and may haul out to sea, going nothing to the southward of S.E. by E., to avoid the N.E. reef. There is no danger between the rocks and reefs of Egg island and English point, excepting the reef off the latter already mentioned.

These directions, taken in the reverse order, will enable a vessel to run through from the eastward; and we shall merely add to them a caution not to approach the N.E. reef off Egg islet, for there are 20 fathoms at the distance of a quarter of a mile from it in every seaward direction, and consequently little warning by the lead.

At night it is extremely difficult to make out Egg island, by reason of the high land under which it lies, and which, coming from the westward, attains its nearest approach to the sea 1½ miles in rear of English point. But this high land, whilst it prevents the island from being readily seen, points out its situation very nearly.

TIDES.—It is high water, fall and change, at Egg island at 2h. 0m.; springs rise 11 feet; neaps 6 feet.

The rate of the tides between Egg island and the main is from a half to one knot, and part of the stream of ebb sets towards and out through the narrow and dangerous 3 fathoms channel between the island and the North rocks. Part of the stream of flood comes in through the same channel.

CALUMET RIVER is a small stream 2½ miles to the westward of Egg island; along the shore for a mile to the south-westward of its entrance, there are reefs of large stones extending out to the distance of 6 cables from high water mark, and having 15 fathoms off them at half a mile to seaward. To the south-west of these reefs, as far as Trinity bay, the coast is free from danger, and may be approached with safety, if due caution be used. There are 20 fathoms at the distance of from half a mile to a mile, and 40 fathoms from 2 to 3 miles from the shore.

CARIBOU POINT, 8½ miles south-westward from Egg island, is a small rocky peninsula, having sandy coves on either side of its isthmus, in which pilot boats find shelter, and often remain on the look out for vessels.

TRINITY BAY, at 5 miles to the south-westward of Caribou point, is 2 miles wide, and nearly 1 mile deep, with a fine sandy beach extending from its south-west point to Trinity river, which is a small and rapid stream, abounding with trout and salmon, where water can be had only at high water, because of the large stones about its entrance. The south-west point of the bay is rocky, and off the north-east point there are two low black rocks; the depth of water between the points of the bay is from 5 to 7 fathoms at low water over sandy bottom.*

This bay affords excellent anchorage, in a moderate depth of water with good ground, and plenty of room to weigh in any wind. It is a valuable stopping place, in westerly winds, for vessels bound up the St. Lawrence, to wait their opportunity to proceed round Point de Monts, and up the Estuary.

PILOTS are generally found waiting in Trinity bay for vessels when the wind is from the westward, but in easterly winds they take shelter in St. Augustin cove, to the westward of Point de Monts.

DIRECTIONS.—In running along the land for Trinity bay, either from the north-east or south-west, come no nearer than the depth of 15 fathoms until the bay opens; then haul in, and anchor in 7 fathoms at low water; with the lighthouse on Point de Monts (seen just within a small rock about $1\frac{1}{2}$ miles to the south-westward of the bay) bearing S.W. by W., the outer of the two rocks off the north-east point of the bay N.E. $\frac{1}{2}$ E., and the entrance of the river N. by W.; the vessel will be then rather more than three-quarters of a mile distant from the south-west point of the bay. Vessels of large draught may anchor farther out, and in deeper water, if more convenient, and small schooners in 3 fathoms, close under the south-west point.

POINT de MONTS LIGHTHOUSE stands low down and close to the sea, at 5 miles to the south-westward from Trinity bay, and E.N.E. rather more than $1\frac{1}{4}$ miles from the south extremity of Point de Monts. It is of conical form, nearly white, and 75 feet high, and exhibits at an elevation of 100 feet above high water a *fixed white* light, which can be seen in clear weather from distances of 15, 20, and 23 miles nearly, according as the height of the observer's eye above the sea may be 10, 50, or 100 feet respectively (*see* page 36, and view on chart).

The extreme of the land to the north-westward near Caribou point bears N.E. $\frac{1}{2}$ E. from the light which can be seen over the point; and that

* *See* Charts:— River St. Lawrence, Part 1, No. 309; scale, $m = 0{\cdot}25$ of an inch: and Sheet 1, below Quebec, No. 311; scale, $m =$ half of an inch.

bearing continued will pass little more than 2½ miles outside of Egg island at the distance of 20 miles from the light.

CAUTION.—Vessels being to the eastward in a dark night, when the land cannot be seen, had better tack; when Point de Monts light bears W.S.W., or even W. by S. will be near enough, if they be as near to it as Trinity bay. They may, however, stand in nearer, using due caution by the lead. Vessels to the westward of the light should tack as soon as it bears E. ½ N.; it cannot be seen to the southward of East, in consequence of the high land which interposes.

When it disappears, a vessel off Goodbout river will be only one mile from the bar (page 45).

The south extremity of Point de Monts as before stated is rather more than 1¼ miles W.S.W. from the lighthouse. S.W. from the lighthouse, S.E. from the extremity of the point, and half a mile off shore, lies a ledge of rocks with 9 or 10 feet least water. S.S.W., half a mile from the lighthouse, is another rock with 2 fathoms on it; and there is a third with little more water, and nearly as far off from the lighthouse to the E.S.E. These dangers should be carefully guarded against in making the light in thick weather, or when keeping close to the land with a northerly wind; and the depth of 15 fathoms is quite near enough to them for a large vessel at any time, being no more than 2 cables distant from the first, and about twice that distance from the two last of them.

ASPECT of COAST.—The land, which on the eastern side of Point de Monts in rather low begins to rise immediately from that point to the westward, and granitic hills very sparingly wooded, and in no part above 1000 feet in height, form the north coast of the Estuary to St. Giles point, distant 30½ miles W. ½ N. from Point de Monts. The section of coast just indicated is as bold as any in the St. Lawrence, there being little or no warning by the lead, neither is there any good anchorage sufficiently roomy for the occasional use of shipping.

ST. AUGUSTIN COVE, 1½ miles westward of Point de Monts, affords shelter only to boats; and pilots are generally found waiting here with easterly winds.

GOODBOUT RIVER, 8½ miles westward from Point de Monts, enters the sea at the extremity of a sandy point, and has a bar of sand, which extends out from the eastern point of entrance to the distance of nearly half a mile, dries in great part at low water, and is extremely bold to seaward. There is usually at low water not more than 4 or 5 feet over this bar, on which a heavy surf very frequently breaks; and the river is only

of use to boats, because of the difficult and narrow entrance, although there are 15 or 16 feet of water over the bar at high water springs. There is a trading and salmon fishing post of the Hudson Bay Company at this river, and the houses can readily be seen.

ANCHORAGE.—It is possible to anchor on either side of the bar of Goodbout river, but too near to the shore to be of general use. The anchorage to the westward of the bar may occasionally be useful in easterly winds to small vessels. They should anchor about midway between the bar and the first rocky point to the westward of it, or about a mile to the westward of the bar.

At this anchorage, which is only safe in summer, the bottom is of coarse sand. The tides are weak and irregular, rendering it difficult to keep the anchor clear in calm weather; they also frequently set towards the shore, coming in with long ripplings parallel to the coast.

DIRECTIONS.—To run for this anchorage, observe that the rocky point just mentioned and the east point of entrance of St. Nicholas harbour in one, bearing W.N.W., just clear the bar; therefore keep the last-named point in sight, until the houses at Goodbout bear N.E., and then the bar will have been passed. After which run in and bring the points in one, running for them until the vessel is judged to be in the position above-mentioned, or until the east extremity of the high clay and wooded banks on the west side of the river, where it turns inland, and which can be seen over the sandy beach, bears N.E. by N. The houses of Goodbout will then bear E. $\frac{1}{2}$ N., Cape St. Nicholas W. $\frac{1}{2}$ N., and the outer extreme of the bar E.S.E. The depth will be 6 or 7 fathoms at low water; towards the shore 3$\frac{1}{2}$ fathoms at the distance of half a cable; then 3 fathoms for the distance of nearly 2 cables farther in; and thence shoal to the beach, distant about three-quarters of a mile from the vessel. To seaward the water deepens rapidly to 30 fathoms at the distance of a third of a mile.

ST. NICHOLAS HARBOUR lies 3 miles to the north-eastward from Cape St. Nicholas, which is a high bare point of granite, bearing W. by N. 17 miles from Point de Monts. This harbour is a narrow inlet between granitic hills from 500 to 700 feet in height, 1$\frac{1}{2}$ miles in the direction of N.W. $\frac{1}{2}$ N., and is so secure that a vessel might be laid on shore and repaired as if she were in a dock; on the south-west side a vessel may lie alongside of the rocks as alongside a wharf. There is as much as 9$\frac{1}{2}$ fathoms at low water, in the deepest part of the harbour, and the bottom is of mud.*

* *See* Plan of St. Nicholas Harbour, No. 1,141; scale, m = 6 inches.

The breadth of the harbour within no where exceeds 380 yards, and at the entrance is only 150 yards. The shoals on the east side of the entrance dry out so far as to leave a channel between them and Cross point only 60 yards wide, and with a depth of 5 feet at low water spring tides.

The depth that can be carried in at high water is from 12 to 17 feet, according as it may be neap or spring tides. The bottom in the entrance is of sand, with some few large stones upon it, which can be seen and avoided, if the tide be not high enough to pass over them. The entrance is situated in the centre of a small bay, three-quarters of a mile wide, and rather more than one quarter of a mile deep to the rocky point on the west side of the entrance to the harbour, which will be readily seen projecting out into the bay, and is named Cross point, from a small wooden cross upon it. An extensive shoal of sand and boulders, which dry at half tide, extends from the east point of the bay, nearly 3½ cables to the W.S.W., and continues northward to the entrance of the harbour. This shoal can always be seen, is quite bold, and completely shuts out the sea from the harbour in southerly and easterly winds. The shoals on the west side extend across a small bay on the west side of Cross point, and continue for the distance of 4 cables out to seaward, extending off-shore to the distance of a cable.

The anchorage between these shoals, in the bay off the harbour's mouth, is only 3 cables wide, and consequently too small to be considered a roadstead for large vessels, but the ground is good, and the depth convenient for anchoring preparatory to warping into the harbour.

Water.—There are several small streams, on the eastern side of S. Nicholas harbour, where water can be obtained; and it can also be had at high water from the two small rivers at the head of the inlet. The stones on the bar of this harbour might be easily removed, and it was ascertained, by boring, that the channel might be deepened to any extent that might be desirable.

CAUTION.—South-east winds blow right into St. Nicholas harbour, and are consequently the most favourable for running in, but with a strong wind in that direction, and at high water when the shoals are covered, there is generally some sea outside the narrow entrance; an accident at such a time might be attended with serious consequences, and therefore it is only in very fine weather that the entrance should be attempted with a south-east wind.

North-west winds blow right out of the harbour, and often with great violence. A W.S.W. wind is the safest for running in, for the entrance and bay outside are then quite smooth, the sea being turned off by Cape St. Nicholas; but this wind will seldom take a vessel completely in, it will usually only enable her to shoot so far within Cross point that a line

may be sent ashore, or a kedge ahead, for the purpose of warping in the remainder of the way, which may be quickly done if due preparation has been made beforehand.

The entrance should be attempted in the last quarter flood, then if the vessel touches the ground she will receive no damage, and there will be time for her to warp in before the tide begins to fall.

DIRECTIONS.—A vessel wishing to enter St. Nicholas harbour, and being off the mouth of the bay, should bring the end of Cross point to bear N.N.E., then steer so nearly for it as to leave it not more than 50 nor less than 30 yards distant on the port hand. If the wind will allow, continue to run in, at the same distance from the shore on the west side, until the water deepens; but if the wind falls, or the vessel is met with light baffling flaws out of the harbour, as often happens in westerly winds, send a line on shore on the west side, or drop the anchor under foot as soon as the vessel loses her way, and warp into deep water.

The shoal water, which may be called the bar, and commences at Cross point, continues for a distance of 2 cables within it, and the channel is rendered narrow by shoals off the eastern side, for an equal distance farther up the harbour. In order to have as much room as possible, a vessel should anchor farther in than the three large rocks, which will be seen on the eastern side of the harbour. To run out again, wait for a north-west wind, or take advantage of the land wind in the early part of the morning, which often occurs in fine weather when westerly winds prevail; or, lastly, warp out in a light breeze or calm, to the entrance of the bay outside, and to a position from which sail can be made.

ST. PANCRAS COVE, 9 miles W.N.W. from Cape St. Nicholas, being only about 320 yards wide, between steep rocks, and open to the southward, with very deep water, is of no use to vessels. The depth is 32 fathoms in its entrance, shoaling gradually to 17 fathoms within a quarter of a mile of its head. The sea is never heavy in it, and a vessel might be saved there in time of need. It affords shelter to boats.

ENGLISH BAY, between St. Pancras point and St. Giles point, affords no good anchorage, in consequence of the great depth of water; a heavy sea rolls into it in easterly winds, and its shores are high and rocky. A vessel might anchor close to the shore on its west side, in 16 or 17 fathoms at low water, and be well sheltered from all but easterly winds; but she would be in great danger if a strong wind from that quarter came in, since there would be no possibility of weathering the eastern side of the Manicouagon shoal during the flood tide.

MANICOUAGON RIVER.—St. Giles point, the northern point of entrance to the Manicouagon river, is 13½ miles W. by N. from Cape

St. Nicholas, and is high and rocky, like the coast to the eastward; while Manicouagon point, which is 17½ miles W. by S. ½ S. from Cape St. Nicholas, is low and thickly wooded, with a broad sandy beach, like the rest of the coast westward to Outard bay. This complete change in the character of the coast points out to a vessel her approach towards the dangerous Manicouagon shoal.*

The Manicouagon river flows out through narrow channels, between shoals that dry at low water, in Manicouagon bay, and over a bar which extends from St. Giles point to the north-east end of the Manicouagon shoal. Six miles West from St. Giles point the shallow channels between the shoals unite in the inner entrance of the river, which is there narrow and 4 fathoms deep. The falls, where the river discharges a great body of water down a narrow and sloping channel between steep granite rocks, are 3 miles farther up in a north-west direction, and a boat may approach close to them.

ANCHORAGE.—The principal channel is on the north side of the entrance, and there is a deep place, or large hole, in it 1¾ miles long, from half to a quarter of a mile wide, and with a depth from 3 to 5 fathoms at low water, with muddy bottom. This large hole is close to St. Giles point, and extends 1¼ miles within it. Although this place appears completely open to easterly winds, no swell of consequence rolls into it, and we believe a vessel well moored on its north side within St. Giles point would be in safety. But to get in there it is necessary to pass over the bar which extends out 2 miles to the eastward from St. Giles point: it has 7 feet over it at low and from 14 to 19 feet at high water, according as it may be neap or spring tides. The outside of the bar is extremely bold, there being 30 fathoms, sandy bottom, close to it, and 50 fathoms, mud bottom, at the distance of one mile. The bar then sweeps round till it joins the Manicouagon shoal, which consists of sand and occasional boulders, and which is dry at low water for nearly 5 miles out, in an E. by N. direction, from the northern end of Manicouagon peninsula.

This is altogether too wild and dangerous a place to be of general use to vessels, but as, nevertheless, it might prove of use in time of need, the following brief directions are given for entering it.

DIRECTIONS.—With St. Giles point bearing W. by S., and St. Pancras point, the eastern point of English bay, bearing North, steer directly for St. Giles point; and when the head of English bay bears North, and St. Pancras point N.E., the vessel will be close to the bar. Continue to run over the bar on the same course, W. by S., until the points on the west side of English bay bear N. by E. ½ E.; she will then be within a mile

* *See* Plan of Manicouagon River, No. 1,146; scale, m = 1 inch.

of St. Giles point, and must keep away a couple of points to the southward along the southern edge of the shoal, which dries at low water off that point, until the points are opened out on the north side of Manicouagon bay to the southward of St. Giles point; then haul up again so as to pass that point at the distance of a cable's length, and anchor half a mile within it, in 3 or 4 fathoms at low water.

TIDES.—The ebb runs out over the Manicouagon bar to the eastward, at the rate of about 1½ knots, and the flood is nearly as strong. It is high water, full and change, at 2 hours nearly, and springs rise 12 feet, and neaps 7 feet.

MANICOUAGON SHOAL is of sand, with many large boulders scattered about its eastern and southern parts, and probably deposited there by the ice. The most eastern point of this dangerous and extensive shoal is distant 2½ miles from St. Giles point, in an E.S.E. direction, and 5¼ miles E. by N. from the north-east end of Manicouagon peninsula.

The bearing of S.W. by S. from St. Pancras cove passes along the eastern side of the shoal, which is so bold that there are 60 fathoms water at the distance of little more than 1¼ miles, and 40 fathoms at half that distance from the breakers. On this side the shoal dries nearly out to its edge in low tides. The south point of the shoal extends 2½ miles to the southward of Manicouagon point, and here only is there any sufficient warning by the deep sea lead. With Manicouagon point on any bearing from North to N.W. by N., 60 fathoms over a bottom of very fine sand will be found at the distance of 3½ miles from the 3 fathoms mark, to which the water shoals gradually, till close to it, where there are 17 fathoms. The shoal dries out in low tides, in this part, and also farther to the westward, from 1 to 1½ miles from the beach.

The shoal continues from its south point to the westward for a distance of 16 miles, the outline of its edge corresponding to the shape of the sandy shore as far as Outard point, off which it extends to the southward 1½ miles, and, filling up all the eastern part of Outard bay, stretches out its western point fully 3½ miles W. by S. from Outard point.

TIDAL STREAMS.—There is often a heavy sea, particularly in a weather tide, off the Manicouagon shoal, but all the terrific accounts which have been circulated of "strong and irregular eddies," in which vessels will not answer their helms during a fresh gale of wind, "and can with difficulty be kept from running on the bank, or driving against each other," are entirely unfounded. But without that exaggeration a shoal which extends so far from a low part of the coast, which is difficult to be made out at night, and which has such deep water close to it, must be sufficiently dangerous to demand the utmost prudence and vigilance of the

seaman, without alarming him with imaginary perils. The tides are tolerably regular, and not very strong along the shoal; the rate of either tide does not exceed 2 knots at any time, and is usually much less. But great ripplings are met with occasionally, both near the shoals and in the offing, where they are caused, as in other parts of the Estuary, by the unequal velocities, or the opposing directions of the streams, as will be readily imagined when it is remembered that the current is always down on the south side, slack in the middle, and up during the flood on the north side of the Estuary (page 27). These ripplings are very common off the eastern and southern parts of the Manicouagon shoal, where they were observed to move much faster than the streams of the tides, as was evident by their passing by the *Gulnare* in a calm. They often give to the tides the appearance of a rapidity which does not exist.

OUTARD RIVER.—Outard point is 11 miles to the westward of the south extremity of Manicouagon point, and the shore between them is of low sandy cliffs, with a sandy beach. Outard river flows on the north side of Outard point, and can be ascended by boats to the falls, over granitic rocks, which are 7 miles, N.E. by E., from the point. These falls are only $1\frac{3}{4}$ miles from the Manicouagon river. The two rivers therefore form the low sandy country, between Outard and Manicouagon points, into a great peninsula, which has probably been produced by the rivers in the course of ages.

The entrance to the Outard river is by several intricate and narrow channels through the western part of the Manicouagon shoal, and as there are only 2 or 3 feet of water through these channels at low tide, for the distance of 4 or 5 miles, the place is useless to vessels, and therefore requires no farther description.

The water of this river holds a white earth suspended, and frequently covers the whole surface of Outard bay, floating on the heavier sea water beneath, and giving the whole bay the appearance of being shoal. A vessel sailing through this superstratum of fresh water displaces it, and leaves a blue streak in her wake.

OUTARD BAY, between Outard and Bersimis points, has three small rocky islands in it, which appear as two from seaward, and serve to distinguish the bay to strangers; they are far within the edge of the shoals, which extend quite round the bay, and occupy the greater part of it, being a continuation of the Manicouagon shoal.

ANCHORAGE.—Good anchorage will be found on the west side of Outard bay, in 14 fathoms at low water, over muddy bottom, with Bersimis

point bearing S.W. by S., 3¼ miles. Manicouagon point will then be open 3 or 4 degrees to the southward of Outard point, the south side of which will bear E. by N., the first rocky point north-eastward of the river N. by W., and the vessel will be nearly half a mile from the 3 fathoms edge of the shoal on the west side of the bay: small vessels may lie closer, in 7 or 8 fathoms.

DIRECTIONS.—In standing in for this anchorage with a westerly wind, beware of the bar of Bersimis river, which is extremely steep. If the first rocky point can be made out to the north-eastward of the river, and which bears from its entrance N.N.E. 4½ miles, take care that it does not bear to the eastward of North, and the vessel will clear the bar. When it is passed, she may haul in to the northward into soundings, going no nearer than 10 fathoms.

Vessels may anchor for a distance of three-quarters of a mile on either side of the position pointed out, either farther out to the S.S.W., towards Bersimis point, or towards the small islands to the N.E., but the above berth is the best. This anchorage, which is not generally known, is excellent in westerly gales; and may occasionally be very useful to vessels bound up the St. Lawrence. The tides are not so strong as has been supposed; the ebb seldom exceeding the rate of 2 knots, and the flood being much weaker. The direction of these streams is reversed by the effect of the Outard river.

BERSIMIS RIVER enters the sea to the eastward, and 1¾ miles N.E. from the south extremity of Bersimis point. The south side of entrance of the river for more than three-quarters of a mile is of low and bare sand. The opposite point of entrance is also of sand, and bears N.N.W., rather more than a mile from the south point, but this wide mouth of the river is closed by sands dry at low water, with the exception of a very narrow channel. The river within, for the first 3 miles, is wide and full of sand shoals.*

The Bar is of sand, which dries in parts at low water, and shifts frequently, being completely exposed to southerly and easterly gales: it extends nearly 1¼ miles to the eastward of the south point of entrance. Directions for entering the river must therefore be useless; but it may be as well to remark, that within the bar the channel is always close to the south point of entrance, and keeps on that side through the wide part within, with a depth of 9 feet at low water. The depth that could be carried in over the bar, in the month of July, was 6 feet at low water,

* *See* Plan of Bersimis River, No. 1,265; scale, $m = 0'{\cdot}6$ of an inch.

and from 13 to 18 feet at high water, according as it might be neap or spring tides.

This river discharges a great volume of water, especially in the spring of the year, and the water is fresh enough for drinking, when the tide is out, 2 miles within its entrance. The river is navigable to the falls, which are 30 or 40 feet high, and over granitic rocks. These falls are distant 30 miles N.W. by N., in a direct line from the south point of entrance; but the distance is nearly 40 miles by following the windings of the river. The banks of the river are high and precipitous, being either of granite or cliffs of sand and gravel over clay. The basins and valleys between the hills are filled with these last named deposits, which support a heavy growth of trees of the pine and spruce species. There is good timber to be met with occasionally. The breadth of the river varies from one to three cables' length, and its depth is usually from 2 to 5 fathoms: there is a place in which the depth amounts to 12 fathoms; but 2 fathoms is as much as could be carried up to the foot of the Falls.

The stream of the flood tide is felt 10 miles up the river; and 6 miles up, the channel is contracted by shoals of sand and boulders to the breadth of 100 yards for the distance of a mile. Through this narrow part, the ebb runs 4 knots; above it, the rate of the current is from 1 to 2½ knots. Boats could row up this river to the foot of the falls, and a steamer could ascend it with ease; but the winds are generally too light and baffling between its high banks for a sailing vessel.

BERSIMIS POINT, is low, of sand, wooded with spruce trees, and difficult to be seen at night. On its east side, the low south point of the river extends to the distance of 2 miles from the trees, and the bar 1¼ miles farther; and to the southward, the sand shoal extends three-quarters of a mile from the sandy beach, yet it is so bold that the lead affords no warning, there being 60 fathoms muddy bottom at a distance of a mile from the edge of the shoal. On the east and west sides of the point the shoals are equally steep, so that this point is very dangerous, especially to vessels beating at night or in foggy weather.

From the south extremity of Bersimis point, Manicouagon point bears E. by N. ¼ N., 21 miles; and Mille Vaches point S.W. by W. ¾ W., 29 miles. In all this last-named distance, if the extreme points be excepted, vessels will find by reference to the chart, that the soundings off the shore afford some warning, although there are parts where great caution is necessary.

The tides are regular, but the flood is rather stronger than the ebb within 6 miles from the shore, where the rate of either seldom exceeds 1½ knots, and is often much less.

JEREMY ISLAND.—From Bersimis point, a low and sandy shore continues 6½ miles to the westward to Jeremy island, which is very small, rocky, and close to the coast. There is a trading post of the Hudson Bay Company on the main, the buildings of which can usually be seen, but if not, its position will always be known by some patches of white sand and clay cliffs, which are close to the eastward of the island. Vessels may stand in by the lead, and anchor off this place; but it is a bad anchorage, and the shoal water extends a mile out from the shore.

CAPE COLOMBIER.—From Jeremy island a rocky and broken shore trends W.S.W., 5 miles to Cape Colombier, which is a rocky peninsula, with a small islet on its west side.

GULNARE SHOAL, discovered during the Admiralty survey of this coast in 1830, is a narrow ridge of granite rock, nearly 2 miles long, parallel to the shore, and having from 2 to 3 fathoms over it at low water. The south-west end of this shoal bears S. by E., and its north-east S.E. by E. ½ E. from Cape Colombier, from which they are distant 1¾ miles. The inner or north side of Laval island nearly on with Orient point, the east point of Laval bay, bearing West, leads 2 cables to the southward of this shoal in 20 fathoms water. It is very dangerous, there being 23 fathoms close to the south-west end, and also along its southern side. There are 4 or 5 fathoms between it and the shore.

WILD FOWL REEF, bearing S.W. by W. ½ W., 4 miles from Cape Colombier, is a large bed of rocks, extending three-quarters of a mile from the shore between Plongeur bay and Laval bay. There are 9 fathoms water at the distance of one-third of a mile outside this reef.

PLONGUER BAY, between Wild Fowl reef and Cape Colombier, may be known by a round and rocky peninsula on its west side. The inner part of this bay is full of rocks dry at low water, and the whole bay is shoal out to the line joining Wild Fowl reef and Cape Colombier.

CAUTION.—Vessels should be careful in standing in towards the part of this coast from Wild Fowl reef to the Gulnare shoal inclusive; the depth of 30 fathoms is quite clear enough, as will be seen by the soundings in the chart. But to the south-westward of the reef, until within 2 miles of Port Neuf, they may stand in to 6 fathoms at low water with safety.

LAVAL BAY, situated 4 miles to the westward of Wild Fowl reef, and 8½ miles N.E. by N. from Port Neuf, will be known by the rocky island in its mouth, and by the clay cliffs which commence 1½ miles to the south-west of it, and continue to within the same distance of Port Neuf.

This bay within the island is all dry at low water. Vessels may safely stand in towards it, the water shoaling gradually from 10 fathoms, which is at the distance of 2½ miles from the shore. There is good anchorage in 6 or 7 fathoms, over clay bottom, off the clay cliffs above mentioned.*

PORT NEUF.—At this port there is a fur-trading and salmon-fishing establishment, belonging to the Hudson Bay Company, who have a lease of the seigniory of Port Neuf. At this post, which stands upon a steep sandy bank, and is 4 miles to the N.E. of Mille Vaches point, there is a small wooden church for the Indians, a dwelling-house, a store, and several smaller buildings. These can readily be seen by a vessel off the coast.

S.S.E. from the church, distant nearly three-quarters of a mile, is the south-west end of a low and narrow sandy peninsula, with a clump of pine or spruce trees upon it, and which extends nearly 2 miles to the N.N.E., where it joins the sand and clay cliffs, which have been previously mentioned.

PORT NEUF RIVER is entered from the south-west, and between the above sandy peninsula and the post on the main land, but is so shallow that a boat cannot enter it at low water. At the junction of the peninsula with the sand and clay cliffs, the river turns abruptly inland: its sandy channel is too shallow for a boat at low water below that turn; and at the distance of 1¼ miles above it rapids commence. From 7 to 12 feet water may be carried in it at high water between the peninsula and the main land according as it may be neap or spring tide, and a small vessel may lie safely aground on the sand.

PORT NEUF SANDS are exceedingly steep on every bearing to the southward of East from Port Neuf, and to the eastward of South from Mille Vaches point. Off Port Neuf they extend three quarters of a mile out from the sandy peninsula. The eastern patch of these shoals, carrying 3¾ fathoms least water, and which might be dangerous to a vessel of heavy draught in a high sea, bears E. by N., and is distant 1¾ miles from the south-western end of the sand and clay cliffs at the entrance of Port Neuf river.

Half way between Port Neuf and Mille Vaches point is the widest part of these sands, which there extend 1¾ miles from the beach. There are from 20 to 30 fathoms close along their edge, and from 40 to 50 fathoms at the distance of a mile.

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* *See* Chart:—River St. Lawrence, Part 2, No. 310; scale, $m = 0{\cdot}25$ of an inch.

MILLE VACHES POINT is low, sandy, and wooded with spruce trees. From its south extremity the North-west reef of Bicquette bears S.S.E. 12½ miles; and the navigable breadth of the channel is diminished by the Mille Vaches shoals to little more than 11½ miles. As the dangers on either side are so bold, and as the course of a vessel running up the Estuary must ever be more or less uncertain in consequence of the set of the tides and currents, this pass is justly considered dangerous to a vessel running up in dark nights or foggy weather. The only safe mode of proceeding, under such circumstances, is that which has been recommended in page 38.

MILLE VACHES BAY, on the west side of Mille Vaches point, is very large, with several small rivers, which descend by falls or rapids down the granitic shores. The principal of these rivers is the Sault de Mouton, 4½ miles West from the point, and which has a fall of 80 feet visible from a vessel when abreast of it. All the interior of this bay is occupied by shoals of sand, mud, and large boulders, which dry at low water.

In the western part of the bay the shoals are extremely steep and dangerous, but from where the Sault de Mouton bears North to where Mille Vaches point comes upon the same bearing, comprising a space of 4½ miles, there is good warning by the lead; the depth being 30 fathoms, upwards of 2 miles from the 3 fathoms edge of the shoals.

ANCHORAGE.—There is anchorage in Mille Vaches bay in 15 fathoms, sand and mud bottom, with the south extremity of Mille Vaches point on with the inner or north side of the pine trees on the peninsula of Port Neuf, bearing N.E. ½ E., at the distance of 2 or 3 miles from the point, and three-quarters of a mile from the shoals. The shelter is from S.W. by W., round north, to N.E. by E. The ground is good, and there is not much tide.

ESQUAMINE ISLETS.—The course and distance across Mille Vaches bay to two large rocks, which have three small ones nearly a mile to the S.W. of them, and are called the Esquamine islets, is S.W. by W., nearly 12 miles. The coast to the south-westward, from these islets to Little Bergeron, a distance of 16 miles, consists of granite rock, steep and bold, and free from all danger, excepting a flat which occupies a bay on the west side of Cape Bondesir, but which does not extend above a quarter of a mile outside of a line joining the points of the bay, and is consequently very little in the way of vessels. There are upwards of 50 fathoms water close to the rocks along this part of the coast.

The TIDES are regular, increasing in strength as we approach the comparatively narrow pass on either side of Red islet. The flood is the

stronger tide of the two, the ebb being deflected over towards the southern shore by the stream out of the great Saguenay river. The flood does not extend above 5 or 6 miles off the north shore below Bergeron, and the closer to that shore the stronger is the stream. Its rate at Mille Vaches point, where it does not extend far off shore, is from 1½ to 2 knots; and off Bergeron from 2 to 3 knots, in spring tides.

GREAT and LITTLE BERGERON are two coves separated by a point. They are both full of large boulders, which dry at low water, and have small streams at their heads. Little Bergeron is of the two the most to the south-west. From it, the light on Green island bears S. by E. ¼ E., 11½ miles; and the Saguenay cliffs, at the east point of entrance of the river, S.W. by W. ¼ W., 5½ miles.

This chapter is terminated at Little Bergeron cove, because the shoals off the entrance of the river Saguenay, and the passage between them and Red islet, belong, according to the arrangement adopted, to Part II, Chap. X.

PART II.

CHAPTER X.

RIVER ST. LAWRENCE.—GREEN ISLAND AND RED ISLET TO THE TRAVERSE AND COUDRES ISLAND.

VARIATION 19° to 17° WEST in 1860.

GENERAL REMARKS.—The estuary of the St. Lawrence has been considered to terminate, and the river to commence, at Green island (page 106); not with any pretension to geographical accuracy of definition, but because the adoption of such a division, at a part where the navigable channel becomes divided, contracted, and difficult, naturally and conveniently separates the sailing directions into parts corresponding with that distinctive change in the nature of the navigation.*

Part I. of these Directions was intended to enable the intelligent seaman to navigate his vessel as high up the St. Lawrence as Green island, without any other assistance than the charts. But Part II. treats entirely of pilot-water, for which reason, and because the plans of the river are published on a sufficiently large scale to show distinctly the nature of the shores, islands, and dangers, it will not be necessary to enter quite so minutely into description as in Part I., where the object aimed at was often to enable a stranger to recognize the land from sea, or to guide his vessel in places not generally known.

Part II. commences at what may be considered the first difficult pass ascending the St. Lawrence—the difficulty arising not only from the dangerous reefs of Green island, Red islet, and the Sanguenay river, but also from the great velocity and transverse direction of the tidal streams.

Some remarks and directions have already been given in Part I. respecting the passage on either side of Red islet and its reef, the

* *See* Plans :—River St. Lawrence below Quebec, Sheets III., IV., and V., Nos. 313, 314, 315; scales, $m = 1$ inch: and River St. Lawrence, Part 2, No. 310; scale, $m = \frac{1}{2}$ of an inch.

Green Island lighthouse and reef, and the anchorage under the latter (pages 47 and 106.)

The whole distance from the lighthouse on Green island to the light-vessel at the Traverse is 54 miles. For the first 30 miles of that distance, the river is divided into two channels (the North and South) on either side of Red islet, White islet, and Hare island, with the reefs and banks attached to them, or bearing their names; all which, lying in the same direction, form a narrow but not continued ridge of greywacké and slate rocks, nearly in the middle of the river. In the remainder of the distance, the river is unobstructed by detached shoals from the south-west end of Hare Island bank, to the north-east end of the Middle ground of the Traverse. The shoals just mentioned were supposed to be connected together by the English bank, which however terminates off Murray bay, 7 or 8 miles to the westward of the Hare island bank. The islands above mentioned, with their reefs, banks, and anchorages, will be first described, and afterwards the mainland, and the channels on either side of them.

RED ISLET, bearing N.W. by W. ½ W. 5½ miles from the lighthouse on Green island, is small, low, and of shingle partially covered with grass, and resting on slate rock (page 46).

LIGHT.—The light tower on the south-west point of Red islet is 51 feet high, and painted red. It exhibits, at an elevation of 75 feet above high water, a *fixed red* light, which in clear weather is visible from a distance of 12 miles.

RED ISLET BANK.—Red islet is quite bold at its south-west end, but a rocky bank or reef, nearly dry in some parts at low water, extends 2½ miles to the N.E. and is 1½ miles wide. There is good warning by the lead in approaching this bank from the eastward, but vessels should be cautious in approaching it from the northward, because the water is deep, and the ebb tide sets strongly upon it on that side. In fine summer weather, vessels becalmed, or bound up, and wishing to wait for the tide, may safely anchor to the East and S.E. of this bank in 10 fathoms at low water, where they will have good ground, and find the strength of the ebb much broken by the bank. In case of need, they may also anchor in the same depth at the distance of 2 cables from the south side of the islet, but the ebb tide runs there at the rate of 6½ knots per hour.

The lighthouse and beacon on Green island are both white, and when in one, bearing S.S.E., lead to the eastward of the Red Islet bank (page 47). A *red* buoy is moored at its east end in 5½ fathoms, from which the south side of Red islet and the north side of Hare island appear in one; and the beacon on Green island open a little to the west-

ward of the lighthouse, S.S.E. $\frac{3}{4}$ E. White islet, kept twice its own breadth open to the northward of Hare island, will lead to the southward: but as these marks are distant, and may not always be plainly distinguished, the lead should never be neglected, nor the vessel taken nearer than the depth of 9 fathoms at low water. There are no marks for leading to the northward of this bank, nor do the soundings there afford sufficient warning for the safety of a vessel; but a *red* buoy in $2\frac{1}{2}$ fathoms marks its extent to the westward.

WHITE ISLET, bearing S.W. $\frac{1}{4}$ W. nearly 10 miles from Red islet, is small, low, and wooded, presenting the appearance of a clump of trees on the only part of Hare island North reef which does not cover at high water. This reef, which is commonly called the White island reef, is composed of a narrow ridge of highly inclined slate rocks, and extends 3 miles to the N.E. of the islet. On its north-east end, which is extremely dangerous, because the flood tide sets strongly upon and over it into the North channel, a *black* buoy is moored in 4 fathoms, from which the south side of White islet and the north side of Hare island appear touching, and the *white* beacon in Cacona parish appears open to the westward of Cacona church. The beacon open to the westward of the church leads to the eastward of the east end of the reef, which vessels should approach no nearer than the depth of 10 fathoms at low water. The passage between the north-east end of the White Islet reef and Red islet is $6\frac{1}{2}$ miles wide and free from danger.

HARE ISLAND, about $1\frac{1}{2}$ miles to the S.W. of White islet, is $7\frac{1}{4}$ miles long in the direction of the river, and less than a mile wide. Its height does not exceed 250 or 300 feet; and it is of greywacké and slate rocks, dipping at a high angle to the south-east, and thickly wooded. The supply of water is extremely scanty on this large island, and fails entirely in the month of August in dry seasons. The soil is not good, and it has no inhabitants.

BRANDY POTS are three round-backed islets of steep greywacké rocks, lying off the south-east side of Hare island, at the distance of a third of a mile. The northernmost islet is the largest and highest, being about 150 feet high, and covered with trees. The southernmost islet, separated from the former by a very narrow channel, dry at low water, is white, and almost bare of trees. The north-easternmost islet is small and wooded. The three islets together cover a triangular space about three quarters of a mile in diameter. The channel between them and Hare island is only fit for boats. There is a good spring well on the south-west point of the northern islet, but it fails in very dry seasons.

BRANDY POT BANK.—The east point of the Brandy Pots bears S. by W. nearly 2 miles from the north-east end of Hare island; it is extremely bold, but a bank, with from $1\frac{1}{2}$ to $2\frac{3}{4}$ fathoms at low water, extends both to the north-east and south-west of it, and northward to the shore of Hare island.

ANCHORAGE.—Small vessels anchor on this bank, half a mile to the south-west of the Brandy Pots, in $2\frac{3}{4}$ fathoms, hard clay and sand bottom, and well sheltered from easterly winds. Vessels of large draught anchor farther out in the stream, in from 9 to 14 fathoms at low water, this being considered an excellent anchorage, although so much exposed in easterly winds. The holding ground is excellent, the tides not very strong, and the sea not so heavy as might be expected. The anchorage to the eastward of the islets in westerly winds is better sheltered, with a less depth of water. Vessels may go as near as the depth of 6 fathoms at low tide as far down as White islet, and have good ground and plenty of room to get under way. The Brandy Pots is the usual rendezvous for vessels bound down the St. Lawrence and waiting for a wind.

A good mark for clearing the Brandy Pots bank for the first mile and a half to the south-west of those islets, as well as to guide vessels of large draught in anchoring with easterly winds is, not to shut the whole of White island in behind the south-east point of the Brandy Pots. The bank which extends to the north-east of the Brandy Pots will be cleared by keeping the whole of the Pilgrim islands open to the southward of the Brandy Pots, or by going no nearer than the depth of 5 fathoms in a large vessel.

HARE ISLAND SOUTH REEF and BANK.—The part of this reef which the tide does not cover lies $2\frac{1}{2}$ miles to the south-west of Hare island, is small and low, of shingle covered with grass and spruce bushes, and rests on slate rocks, which dry at low water for a considerable distance from it, both up and down the river. This reef is situated towards the northern side of the Hare island bank, which is of great extent, with not more than 9 feet at low water, over the greater part of it. The eastern end of this bank, in 3 fathoms at low water, bears E. by N. $\frac{1}{2}$ N. 3 miles from the reef. About a quarter mile to the westward of the east end of the bank, there is a small rocky knoll, with 2 fathoms least water, from which White islet is only just shut in behind the south side of Hare island; and the south-west end of Hare island bears N.W. $1\frac{1}{4}$ miles. A *red* buoy is moored near it in 3 fathoms, with the south side of Hare island and the middle of White islet in one, and the south-west end of Hare island bearing N.W. $\frac{1}{4}$ W.

At the distance of two-thirds of a mile from the east end of Hare island bank, there is a small 3-fathoms patch, bearing from Hare island South

reef E. by N. ½ N.; and from the south-west end of Hare island E.S.E. 2 miles. It is thought that 4 fathoms can be carried through between this patch and the east end of the bank, by keeping Hare island and White islet touching, but it is a narrow channel, and the bottom is so foul and uneven that we cannot be certain. The leading mark in the old Directions, viz., White islet, midway between Hare island and the Brandy Pots, clears the knoll, but leads right over the 3-fathoms patch. But in fact there is no channel here for a ship of heavy draught at low water, for a ridge of sand and rock, called the Middle bank, with not more than from 3½ to 4 fathoms in low tides, extends all the way from the Hare Island bank to the Middle shoal and nearly to Barrett ledge.

Between Hare Island bank and the south-west end of Hare island there is an unfrequented channel half a mile wide, and with from 3½ to 4 fathoms water in it. To the south-west the Hare Island bank extends 6 miles from the reef of the same name, and its south-west end will be cleared in 3 fathoms, by keeping Kamourasca church just open to the westward of Grande island, bearing S. by W. ½ W. A *red* buoy, in 4 fathoms, is placed on it, with the north sides of Hare island and reef in one; and two beacons in one on the east end of Grande island, Kamourasca. One of these beacons is *red*, the other *white*, and they bear when in one S. ¼ E.

ANCHORAGE.—There is good anchorage all along the south side of Hare Island bank in 7 fathoms, which depth is near enough for a vessel of large draught.

BARRET LEDGES are two small patches of rocks, a third of a mile apart, on a W. by S. line of bearing, and having 7 and 8 fathoms between them. There is equally deep water close to these rocks on all sides excepting the south-west; and there are 10 and 11 fathoms within a quarter of a mile of the eastern rock. The western ledge has 12 feet, and the eastern 10 feet at low water.

From the eastern ledge, the south-east point of the Brandy Pots bears W. ¼ N. 2½ miles; centre of White islet N.N.W. 3½ miles; Loup point S.E. by S. 3 miles; the south-east point of Great Pilgrim island is in one with a remarkable summit in the highlands of Kamourasca, bearing S.W. ¾ S.; and the south-west point of Hare island is in one with the south side of Eboulemens mountain, bearing W. by S. ¾ S. Lastly, the whole of the Bay of rocks, on the north shore, is well open to the eastward of Hare island. The remarkable summit in the highlands of Kamourasca kept well open of the south-east point of the Great Pilgrim leads to the southward of the ledge; and the south side of Eboulemens

mountain, kept well shut in behind the south-west point of Hare island, leads to the northward of the ledge and also of the Middle shoal.*

The western ledge lies exactly in the line joining Loup point with the north-east point of Hare island, and with the south-west side of the Bay of Rocks: the two last bearing in one from the rock N.W. ¼ N.; and the south point of the Brandy Pots W. ¼ N. 2 miles. A *chequered black* and *white* buoy is moored on the north side of this ledge in 6 fathoms, with the white diamond beacon on Hare island in line with the eastern extreme of the Brandy Pots; and the south side of the southernmost mountain of Kamourasca in line with the south-east point of the Great Pilgrim.

MIDDLE SHOAL is a small patch of rocks at the north-east end of the Middle bank; it has 10 feet least water, and bears from the western Barrett ledge S.W. ¼ W. $1\frac{1}{10}$ miles. There are from 4 to 8 fathoms around and close to this shoal, and 5 fathoms between it and the ledge. It lies exactly in the line from the extreme of Loup point to the north-west point of the Brandy Pots, the latter bearing N.W. by W., and the south point of the same islands N.W. ¼ W. 1½ miles. A *white* buoy is moored upon it, in 10 feet water, from which the square white beacon on Hare island appears open to the westward of the Brandy Pots; and the south-west end of Hare island in one with the summit of Eboulemens mountain.

SOUTH SHORE,

BELOW THE TRAVERSE.

GREEN ISLAND and REEF, having been described in page 106, it is only necessary to add, in addition to the leading marks given for clearing the latter, that the south extreme of the Pilgrim islands touching the west extreme of Green island will also lead to the north-west of the reef in 5 fathoms: but the Pilgrims are so distant that they can only be made out from the reef in fine clear weather. Green island is of greywacké and slate rock; wooded, and rising to about 250 feet above the sea. The channel between the island and the mainland is a mile wide in the narrowest part, and dries at low water, with the exception of a very narrow channel for boats.

Green island extends 5 miles S.W. by W. from the lighthouse, with bold and rocky shores. Its south-west point is low and bare, and has a dangerous reef extending from it a mile to the westward, and curves out to the northward beyond the general line of the island, so as to

* *See* Views B and C on Plan.

bring the lighthouse to bear N.E. by E. $\frac{3}{4}$ E. The north side of this reef is so bold that there is no warning by the lead. At night, vessels should come no nearer to it on that side than 25 fathoms water, nor bring the light to bear to the northward of E.N.E., until the eastern end of Cacona bears S.S.E., which bearing leads it to the westward.

The flood tide sets strongly over the tail of this reef towards Cacona, and the ebb the contrary. There is generally a great rippling off the end of the reef caused by the meeting of the flood tides from either side of Green island.

ANCHORAGE.—Midway between the south-west end of Green Island reef and the Cacona reef there is good anchorage and shelter from easterly winds, in 6 fathoms, muddy bottom, but there may be delay and difficulty in getting out when the wind changed to the westward, on which account it is seldom used.

CACONA is a remarkable rocky peninsula, about $1\frac{1}{2}$ miles long, 300 or 400 feet high, and joined to the main by a low and marshy isthmus. Its west point bears S.W. by S. $3\frac{1}{4}$ miles from the south-west end of Green island, and is quite bold; but a reef of slate, dry at low water, extends from it north-eastward to the Cacona rock, which is small, bare, bold, always above water, and distant 4 cables from the north point of Cacona.

PERCEE ROCKS form a long reef which commences $1\frac{3}{4}$ miles to the south-westward of Cacona, and extends 2 miles farther in the same direction, parallel to the shore, from which it is distant about a mile. Two patches of rocks, about a mile apart, lie upon this extensive reef; they can almost always be seen, since they are only covered in high tides. There is a narrow channel, with $3\frac{1}{2}$ fathoms water in it, between this reef and the mainland.

Green island and Cacona peninsula, just touching, and bearing N.E. by E., lead along the north side of the Percée rocks in 3 fathoms water; therefore keep those marks open, and they will lead to the northward. Loup River church on with Loup point, bearing S. $\frac{3}{4}$ W., will lead fully half a mile to the westward. At night come no nearer to these rocks than 8 fathoms water, for they are very bold to the northward.

LOUP RIVER, the entrance to which is $5\frac{3}{4}$ miles S.W. $\frac{1}{2}$ S. from the west point of Cacona, and 5 miles S.E. by E. from the Brandy Pots, is a considerable stream, opening to the westward, with 3 feet at low water in its entrance. Boats can ascend it about a mile at any time excepting at low water, and vessels have laid aground just within the entrance, and taken in their cargoes of lumber; but it was not found to answer, and they now

load outside. Recently a pier has been constructed, having 16 feet water at its end in the lowest tides. There are rapids, mills, and a bridge, rather more than a mile up the river, where boats may be sent for water when the tide is in.

ANCHORAGE.—The anchorage off Loup river is better sheltered than that of the Brandy Pots in easterly winds, and is well sheltered in south-west winds also, but the riding is very heavy with a gale from the northward. The best berth is rather to the eastward of the line joining the point of the river and the Brandy Pots, in 4¼ fathoms, mud bottom, and from three-quarters to a mile off shore. Farther to the south-west there is less water and bad ground on Loup bank, which consists of slate, thinly covered with sand and mud, and extends 3 miles out from the shore to the 3 fathoms line, reaching from the river in a W.S.W. direction as far as the Pilgrim islands.

PILGRIM SHOAL is a long and narrow ridge of red slate rocks, thinly covered with sand, and extending 4 miles S.W. ½ W. or parallel to the northern edge of the Loup bank. The shoal is not above a third of a mile wide, and has from 12 to 15 feet least water. The channel between it and the Loup bank is less than 2 cables wide, and with only 3¼ fathoms water in it. On the eastern end of this shoal, in 3 fathoms, the north-east end of the trees of Hare island and the eastern side of the Brandy Pots are in one, bearing N. by E.; Cape Eagle and the north-east side of Hare Island reef are just open, W. ½ S.; St. Andre point is seen through between the Great and Middle Pilgrims, S.W. ¾ W.; and the east point of the Pilgrim islands bears S.W. by S. 3¼ miles.

On the south-west end of the Pilgrim shoal, Cape Salmon appears well open to the westward of the Hare Island reef, the south-west side of the latter bearing W.N.W., and the north-east end of the Long Pilgrim bears S.S.E. three quarters of a mile. A *black* buoy is moored on the north-west extreme of the shoal in 4¼ fathoms, on the line uniting the western end of Hare island and the western end of Great Pilgrim island; and with White islet and the west end of the Brandy Pots touching. The ship channel between this buoy and Hare island bank is a mile wide.

The PILGRIMS are five islands of greywacké rock, and their eastern point bears S.W. by W. 7⅔ miles from Loup point. The two western-most islands are nearly white, bare of trees, and so nearly joined together as to appear like one; hence they are called the Long Pilgrim, and form a narrow precipitous ridge 3 miles long, in a S.W. ½ W. direction. The two Middle Pilgrims and the Great Pilgrim, which is the easternmost, are connected by reefs, dry at low water; but between them and the

Long Pilgrim there is a narrow channel, with not more than 2 feet water in one part, but having a deep hole with 4 fathoms exactly between the Long and the Westernmost Middle Pilgrim.

The Middle and Great Pilgrims extend about 1¾ miles to the eastward of the Long Pilgrim, and the whole extent of these islands is about 4¾ miles, in a direction parallel to the shore, from which they are distant 1½ miles.

The Great or eastern Pilgrim is the highest, being about 300 feet high, partially wooded with scrubby spruce trees, and is very remarkable.* Shoal water, less than 5 fathoms, extends from a half to three-quarters of a mile off the northern side of the Long Pilgrim, being widest at the south-west end. There is no channel between the Pilgrims and the main, where it is so shallow that carts can cross in low tides.

The church of St. André is on the mainland, opposite to the south-west end of the Pilgrims; and St. André point, a small and high rocky peninsula, lies to the westward of it.

ANCHORAGE.—There is anchorage for small vessels in westerly winds under the Long Pilgrim, and abreast of the Great Pilgrim in 2½ fathoms.

ST. ANDRE BANK extends from the Pilgrims to the Kamourasca islands, and in many places dries out more than a mile from the shore. Its northern edge is very steep, but there is an excellent mark for it, viz., the south sides of Burnt and Grande islands in line, bearing S.W. ¾ W., which leads along it at the distance of from 1½ to 2 cables from the 3 fathoms line of soundings.

KAMOURASCA ISLANDS lie nearly 6 miles to the south-westward of the Pilgrims, and 2½ miles from the mainland, to which they are joined by shoals which dry at low water. Grande island is the north-easternmost, and together with Burnt island extends about 2 miles along the northern edge of the bank. On the eastern end of Grande island there are two *beacons*, the one *red*, and the other *white*. When in one, and bearing S. ¼ E., they form a cross mark for the red buoy on the south-west end of the Hare Island bank in 4 fathoms (page 244).

These islands are long and narrow ridges of greywacké rock, and are extremely bold to the northward, there being 20 fathoms water close to them. Crow island lies about three quarters of a mile to the S.S.W. of Burnt island, and there are besides two small and bare rocky islets to the eastward of Crow island, and within Burnt island. Crow island is distant about three quarters of a mile from the shore at the church and town of Kamourasca, and carts can cross to it at low water. There is a wharf and

* *See* View B in Plan.

good landing near the church, and water may be obtained at any time of tide when there is depth enough for boats over the shoals, but there is no water on the islands.

KAMOURASCA BAY, which is immediately to the south-west of the town, is well sheltered, and small vessels may safely lie aground and winter there, on a mud bottom, which dries at low water. Moreover, this is a place where vessels in distress, when they have lost their anchors, may be saved by running them in at high water, between the reef of Cape Diable and Crow island, leaving the latter from a quarter to half a mile to the eastward in passing; and when within the reef, hauling into the bay to the S.W. In high spring tides 13 or 14 feet of water will be found over the mud, but in neap tides there is seldom more than 9 or 10 feet.

ANCHORAGE.—There is good anchorage off Kamourasca with the prevailing winds up and down the river, but exposed to north-west winds. The best berth to anchor in is where the church of Kamourasca is just open to the westward of Crow island, bearing S.E. $\frac{1}{4}$ E., and Grande island just open to the northward of Burnt island, N.E. $\frac{3}{4}$ E. There 7 fathoms over stiff mud will be found at the distance of 4 cables from the 3 fathoms edge of the bank. Large vessels wishing for more room may anchor farther out anywhere to the westward.

CAPE DIABLE.—Three miles S.W. by W. from Crow island, across the bay of Kamourasca (all dry at low water), is Cape Diable, from which reefs of slate extend north-eastward, more than half way to Crow island, and north-westward three quarters of a mile; in which last direction the distance out to the 3 fathoms edge of the bank is nearly $1\frac{1}{4}$ miles.

ORIGNEAUX POINT.—St. Denis point is nearly 3 miles to the W.S.W., and Orignaux point $7\frac{3}{4}$ miles W. by S. $\frac{1}{2}$ S. from Cape Diable. Orignaux point (where a landing-pier, 1,200 feet long, and with 15 feet water at its end in the lowest tides, has recently been erected) is an extreme of the land running out to within three-quarters of a mile of the edge of the bank, and the land trends from it S.W. $\frac{1}{2}$ S. $1\frac{1}{2}$ miles to Iroquois point, and 4 miles to Ouelle point, where the distance out to the 3 fathoms edge of the bank increases again to fully 2 miles.

RIVER OUELLE has its entrance to the westward on the south side of Ouelle point. In high spring tides, 15 feet water can be carried into this river, and up to the bridge at the village, and near the church of the same name, about $1\frac{1}{2}$ miles from the entrance.

The church and village of St. Anne has some very remarkable hills near it, and stands upon rising ground S. $\frac{1}{2}$ W. $3\frac{3}{4}$ miles from Ouelle

point. The church and village of St. Roque is nearly 8½ miles S.W. ¼ W. from the same point; and nearly three-quarters of a mile to the eastward of St. Roque point.

ST. ROQUE POINT bears S.W. by W. 9 miles from Ouelle point; and from this line to the shore, a distance of 2¼ miles, the bay of St. Anne dries at low water, the bottom being mud, but with thousands of boulders or large stones.

The bank of shoal water, extending from the south shore to the distances which have been mentioned at the principal points, continues in a W.S.W. direction all the way from the Kamourasca islands to the Traverse, and beyond that passage, the south side of which it forms. Off St. Anne and St. Roque, this bank takes the name of these villages, being known by the name of the Shoals of St. Anne and St. Roque.

SHOALS of ST. ANNE extend fully 5 miles out from the high water mark, and are very dangerous. They are of sand and mud thickly strewed with very large stones, many of which show at low water. The St. Anne buoy is *black*, and moored on the north-western edge of these shoals in 2½ fathoms, with St. Anne church bearing S.E. ¾ S. and Cape Diable open to the northward of St. Denis point. All along the edge of the bank, from Kamourasca up to this buoy, there is excellent anchorage in from 7 to 10 fathoms, stiff mud bottom.

The shoals trend in a S.W. W. ¼ W. direction nearly 5 miles from the St. Anne buoy to the light vessel at the Traverse, which is moored on the outer point of the shoals of St. Roque, and is described in page 270 of the next chapter, where will be found a brief description and directions for the Traverse.

ENGLISH BANK is a ridge of sand, varying in breadth from half to 1¼ miles, and extending north-eastward from the Middle Ground of the Traverse. For the first 7 or 8 miles (that is down to about abreast the river Ouelle) it runs nearly parallel to the edge of the Shoals of St. Anne, at the average distance of a mile; farther eastward it trends to the northward towards Murray bay, which it approaches to within 2¼ miles, and its north-eastern extremity in 10 fathoms is more than half a mile to the westward of a line from the church at that place to the church at Kamourasca. On the western and greater part of this bank the depth is between 6 and 8 fathoms; and on the eastern part from 9 to 11 fathoms. The English and Hare island banks have been made to join in the old charts and directions, but that is an error, since there is a distance of 7 or 8 miles between them, in which the river is deep from shore to shore, as will be seen by the Admiralty plans.

SOUTH CHANNEL,

BELOW THE TRAVERSE.

GENERAL OBSERVATIONS.—The South channel is justly preferred for the common purposes of navigation. In that part of it which is below the Traverse, the tides are not so strong nor the water so inconveniently deep as they are in the corresponding part of the North channel below Coudres island. Moreover it possesses good anchorage almost in every part, and water enough for vessels of the largest draught at all times of the tide. It is true that several of our line of battle ships and large frigates have touched the ground in passing the south-west end of Hare island, but that has arisen from their following the usual route to the northward of the Barrett ledges, and into the Brandy Pot channel: a course which has been erroneously represented in former directions as always to be preferred by vessels of large draught. It is, on the contrary, only ships of heavy draught which need to shun that course, as entailing upon them the necessity of crossing the Middle bank in from 3½ to 4 fathoms at low water, or even in a less depth, if they cross it according to the old directions, with White island open between Hare island and the Brandy Pots.

There is deep water, from 14 to 20 fathoms, between the Middle bank and Hare island, but it ends in a "cul de sac;" there is no getting out of it into the main channel without crossing the Middle bank to the southward, which should never be attempted in a ship of the line or very heavy frigate before half flood. It would, however, be far better for such heavy ships to pass to the southward of the Barrett ledges, Middle shoal, and Middle bank, where the channel is direct, and for a very large ship (that is, from 5 fathoms to 5 fathoms at low water) a mile wide in the narrowest part, with from 6 to 11 fathoms water over clay and mud bottom. With the assistance of the buoys placed on the Middle shoal, on the knoll near the eastern end of Hare Island bank, and on the northern edge of the Pilgrim shoal, (*see* pages 244, 245, 248,) a ship of the line might beat up or down with safety.

The circumstance which has given a preference to the Brandy Pot channel to the northward of the Barrett ledges, and which will continue to do so for the common purposes of navigation, is the advantageous position of the anchorage at the Brandy Pots, especially in northerly winds, when it is absolutely necessary that vessels bound down the river should be to windward on account of the rapid tide setting to the southward from between the White Islet reef and Red islet. Moreover vessels bound to sea usually rendezvous at the Brandy Pots to wait for a wind, or the tide:

one ebb being sufficient, with a moderately good working breeze, to take them down below Green island, where they can always gain ground to the eastward whilst the weather remains fine. The Brandy Pots also are about the point that a fair sailing merchant vessel can reach in one flood from the anchorage under Green Island reef, where they usually wait for the tide when beating up with westerly winds.

Referring to pages 47 and 106 for the approach to Red islet and Green Island reef, we shall proceed to give brief directions for ascending the river by the South channel.

DIRECTIONS from GREEN and RED ISLANDS to the BRANDY POTS.—Vessels arriving as high up as Green island by day, with clear weather and a fair wind, will require little information beyond that which the Admiralty plans furnish, for their guidance to anchorage off either the Brandy Pots or Loup point, where they may wait for a pilot, or proceed farther as they may prefer. They will of course observe the clearing marks and directions for Green Island reef, Red Islet reef, the Barrett ledges, and Percée rocks (in pages 242 to 251), and that the Brandy Pots and Hare island, touching and bearing S.W. by W.,* lead through between Green island and Red islet nearly in mid channel, and serve as an excellent guide to vessels bound either up or down in this part of the river. The rate and directions of the strong tides can never be safely neglected, but must be especially attended to at night, or in thick weather. With a side wind, too, their oblique direction across the river must be allowed for.

In a vessel coming up the river, and being under the north shore with a northerly wind, proceed as follows:—If wishing to take the South channel, bring the Green island lighthouse and beacon in one, bearing S.S.E, and run down upon this leading mark (passing to the eastward of the *red* buoy on the east end of Red islet reef), till White islet is opened fully twice its own breadth to the northward of Hare island. Then haul up, and if the tide be flood she has merely to take care not to close those marks for clearing the south side of Red Islet bank, which, with the flood, she need not approach nearer than the depth of 10 fathoms. It is of consequence to observe (more particularly with a southerly wind than in this case) that the flood sets through between Red islet and the White Islet reef, and strongly over the tail of the latter into the North channel.

But with the ebb tide a vessel must luff up close under the Red Islet bank, taking care however to keep White islet fully twice its own breadth open to the northward of Hare island, and not to approach the bank nearer than 7 fathoms water, till Red islet bears N.W., when she can keep her

* See View A. on Plan.

luff as close as it may be found necessary to prevent her being set over to the lee shore by the strong ebb coming from the North channel between White and Red islets, and setting over towards Green Island reef. The same marks (White islet open of Hare island) may be kept on until she approaches the White Islet reef to 10 fathoms water, or the *black* buoy on its east end, when she must edge away along the south side of that reef, where the tides set fairly up and down the river, and are of moderate strength.

It is scarcely necessary to mention that in the voyage down the river also, these tides must be attended to. For instance, with a northerly wind and ebb tide, keep well to windward under the White Islet reef, and so as not to be set down towards the Green Island reef. With a southerly wind and flood tide, on the contrary, a vessel must keep well to the southward, in order to avoid being carried by the tide into the North channel.

At Night, when the lights on Green and Red islands can be seen, their bearings and the soundings in the chart will prove sufficient guides, even although the land should not be seen. In a vessel under the north shore, coming up with a northerly wind, bring the Green island light to bear S.S.E., and bear up across the tail of the Red Islet bank, allowing for the tide so as to keep the light on that bearing. Whilst crossing towards the light on that bearing she will have 11 or 12 fathoms when in the stream of the bank, and be $1\frac{1}{4}$ miles distant from its eastern end in 3 fathoms water. Keep the lead quickly hove, and if the tide be flood, care must be taken that it does not set her too near the end of the bank. The depth of 10 fathoms is as near as she ought to go at night.

Continue the course towards the Green island light until the soundings deepen to 20 fathoms, or until the Red islet light bears W.S.W., then haul to the south-westward under the Red Islet bank. Pass it in 20 fathoms water, which is near enough for a stranger at night, and when the Green island light bears S.E. by E. $\frac{1}{4}$ E., she will be on the line from it to Red islet light, which will be distant about $1\frac{1}{2}$ miles. From this position the south point of the Brandy Pots will bear S.W. $\frac{1}{2}$ W., $13\frac{1}{2}$ miles ; but bear in mind what has been said of the set of the tides between Red islet and the White Islet reef, and the course must be regulated accordingly, the vessel being guided also by the bearing of the light and more especially by the soundings in the plan.

In a vessel coming up, with an easterly wind, as directed in page 43, and having made the Green island light, run up in 20 fathoms until she is within 3 miles of it, or till it begins to bear to the southward of S.W. Then haul out into more than 30 fathoms, and run up in the deep water, till the light bears S.E., when she will be well past the reef,

and may continue to run up, coming no nearer to Green island than 25 fathoms water, in order to avoid its western reef (page 246). Violent and breaking ripplings, which change their position with the time of tide, will be met with between Green and Red islands, but there is no danger beyond those which are shown in the charts. An easterly gale against the ebb tide causes a heavy sea.

As soon as the vessel has passed Cacona, and wishing to make the Brandy Pots, haul over to the north-westward, towards White islet, into 9 or 10 fathoms, and run up in that depth till those islands are seen; do not come to the southward into deeper water for fear of the Barrett ledges. If wishing to run up to the southward of that ledge, keep Green island light only just shut in behind the west end of Green island, bearing N.E. by E., sheering to the northward occasionally to sight it, or going no farther to the southward than 8 fathoms until sure that the Percée rocks are passed. The Green island light only just shut in behind, or kept only just in sight over the low west extreme of Green island, bearing N.E. by E., will lead clear to the southward of the Barrett ledges, and nearly in mid-channel between the Middle bank and Pilgrim shoal. It is seldom, however, that the light can be seen so far as the latter. Whenever it disappears, providing there is a certainty that the vessel is past the Percée rocks, haul to the southward into 6 or 7 fathoms, and run up along the south side of the channel in that depth, consulting the charts; or anchor till daylight, as may be preferred.

We have given no direction as to what course should be steered, or what distance run, because they must vary with the circumstances of tide and wind. The courses and distances from one place to another will be seen on the charts, but the bearings of the light, or the land, combined with the soundings, can alone be trusted for the safe conduct of a vessel in such a navigation.

In beating Winds, as the set of the tides has been mentioned, and will moreover be seen in the charts, it seems only necessary to observe that a vessel waiting tide under Green Island reef, should not wait for the stream of flood to make, but should weigh as soon as it is low water by the shore. She should then stand across the remaining stream of the ebb towards the tail of the Red Islet bank, where she will meet the first of the flood, and should work up in it as far as Red islet, by which time the flood will have made on both sides, and she may therefore stand over to the southward. Generally speaking the ebb is very strong, the water deep, and the bottom not good for anchoring below Cacona; nevertheless in case of the wind failing, vessels are sometimes anchored in about 20 fathoms any where along the shore of Green island above the light-

house. The tides are not strong there, but the ground is bad, and the vessel so near the shore that the occurrence of a strong northerly wind would be attended with much danger. Most merchant vessels, with a good working breeze, can beat from below Green Island reef to the Brandy Pots in one tide. In neap tides, however, it is often not easily accomplished, for the flood is then imperceptible in the centre of the passage, and a vessel can beat against it with ease.

DIRECTIONS from the BRANDY POTS to the TRAVERSE.—Vessels proceeding up the river from the Brandy Pots may cross the Middle bank anywhere to the westward of a line from the western point of those islands to Loup River church, and to the eastward of Hare Island bank (*see* page 244). But if they wish to have more than 3 or 3½ fathoms, they must depart from the old directions, and cross with White islet open to the eastward, instead of westward of the Brandy Pots. The north-east extreme of the trees of Hare island, just open to the eastward of the Brandy Pots, is a good line to cross upon. We do not think there is less than 4 fathoms in ordinary spring tides upon that line.

Having crossed the Middle bank, and deepened the water to the southward into 8 fathoms, steer S.W. by W., and if the compasses are correct, the *black* buoy on the north-west extreme of the Pilgrim shoal and the Kamourasca islands will be a little on the port bow. If the weather be clear, Burnt island will be distinguished from Grande island by the time the vessel is abreast of the Great Pilgrim. Open the north side of Burnt island, only just in sight to the northward of Grande island, bearing S.W. ½ W., and keep it so as a leading mark, should the buoy not be in its place, to clear the western part of the Pilgrim shoal (*see* page 248). When past that shoal, with a leading wind and clear weather, nothing more seems requisite than to pay attention to the soundings in the charts, and regulate the course accordingly; S.W. by W., allowing for deviation, will lead past the Kamourasca islands, after which a vessel must incline more to the westward, following the edge of the South bank in 8 or 9 fathoms up to the *black* buoy on the Shoals of St. Anne.

In thick weather, or at night, after crossing the Middle bank to the southward, as before directed, either one side of the channel or the other should be taken as a guide for running up by the lead, say in 7 fathoms. Either side may be taken as high up as the middle of the Long Pilgrim, after which the south side of Hare Island bank must be followed in the same depth; for the western part of the Long Pilgrim, the St. André bank, and the Kamourasca islands, have deep water close to them, affording no guidance by the lead. After having passed the *red* buoy on the south-west end of the Hare Island bank, and proceeded 5 or 6 miles

beyond it, the Kamourasca islands will have been passed, and the edge of the South bank may be easily followed in 7 fathoms, or in 10 fathoms, if the vessel be of large draught, up to St. Anne *black* buoy.

With beating winds, the lead and the soundings in the charts must tell when to tack, excepting in the case of the St. André bank. In the board from the northward towards that bank, tack immediately after Burnt island disappears behind Grande island, and before it reappears to the southward (page 249).

With a good breeze and a fair sailing vessel, the anchorage off Kamourasca (page 250) will be gained from the Brandy Pots in one tide. If not, there is good anchorage and easy tides all along the southern side of Hare Island bank, as well as off its south-west end. A vessel with a good breeze will beat from Kamourasca to the St. Anne buoy with one good tide; but not always in neap tides, when the flood is weak in that wide and clear part of the river. The English bank will be an excellent guide to a vessel beating at night, and she may anchor on any part of it in fine weather, but will find the tides becoming strong upon it in proportion as she approaches the Traverse. The anchorage all along the south shore, up to within 2 or 3 miles of the light vessel at the Traverse, is far preferable. For directions continued through the Traverse, see page 276.

NORTH SHORE,

BELOW COUDRES ISLAND.

ASPECT.—The northern shore of the St. Lawrence from the Saguenay river to Coudres island is bold and mountainous. The granitic hills in most parts rise immediately from the river, forming steep or precipitous headlands. Near the entrance of the Saguenay these hills are not above 1,000 feet high, but those of Eboulemens attain an elevation of 2,547 feet above high-water ordinary springs.

At page 239, the coast of the Estuary was described up to Little Bergeron cove; we shall now recommence from that point, and proceed with the description to the westward.

VACHES POINT, the east point of entrance of the Saguenay river, bears S.W. by W. $\frac{1}{2}$ W. about 6 miles from Little Bergeron cove; and N.W. $\frac{3}{4}$ N. $6\frac{1}{2}$ miles from Red islet. The high clay cliffs at this point are easily recognized; they are known by the name of the Saguenay cliffs. From the anchorage of Moulin Baude, in 7 fathoms, mud, these cliffs bear W. by S., distant 3 miles, and Red islet and the south-west end of Green island are in one; the vessel will here be 4 cables' distant from the 3 fathoms line of soundings and nearly a mile off shore. The water becomes

deep immediately outside this anchorage, which is of use to vessels coming up under the north shore with a scant north-west wind, at the end of the flood and close of the day, and wishing to wait for the next flood, or for daylight; also for vessels waiting for a wind to enter the Saguenay.

VACHES PATCH.—Vaches reef dries out half a mile from Vaches point, and shallow water continues nearly to Vaches patch, which bears S.W. by W. 1¾ miles from Vaches point. A *black* buoy in 2¼ fathoms points out its position; and there is a *chequered black* and *white* buoy nearly a mile to the southward of it, in 3 fathoms on the Outer patch, which is near the eastern end of the Bar reef. These buoys, and also the *white* buoy at the outer extreme of the Lark reef, and the marks and beacons for placing them, will be found described in page 303, which describes the Saguenay river.

LARK POINT, the south-western point of entrance of the Saguenay, bears S.W. ½ S. 2½ miles from Vaches point, and is also of clay cliffs, but much lower than those of Vaches point. Lark islet, small and low, lies off this point a mile to the E.N.E. and is joined to it by sand and boulders dry at low water.

LARK REEF is of sand and boulders, dry at low water nearly out to the edge of the shoal water, which extends nearly 3¼ miles in a S.S.E. direction from Lark point. Lark patch, near the southern end of this reef, never covers, and outside of it, in 4½ fathoms water, lies the *white* buoy above mentioned. Between this extensive reef, and those which extend 1¾ miles S.E. from Vaches point, is the entrance of the Saguenay river; but, as the navigation of that river is quite distinct from that of the St. Lawrence, we shall reserve it for a future chapter, and have here only mentioned the extensive reefs off its entrance, in so far as they are dangers to be avoided by vessels bound up the North channel of the St. Lawrence.

The mark for leading clear of those reefs and of Lark reef is so distant that it can seldom be made out even in fine weather. It is the western sides of the Brandy Pots and White islet in one, and open to the southward of Hare island, bearing S.S.W. ¾ W. Running on this mark a vessel will pass outside of all the dangers off the entrance of the Saguenay, including Lark reef, which she will pass in 5 fathoms at low water, and at the distance of about half a mile from its 3 fathoms edge. There are rocky patches farther out on which the least water found was 7½ fathoms; if it be wished to pass outside of them, the Brandy Pots must be opened out to the southward of White islet.

CANARD RIVER is a small stream, celebrated for wild ducks, at the western termination of the clay cliffs, 2½ miles S.W. of Lark point, and can only be approached in a boat near high water.

ECHAFAUD ISLET.—This is a small, steep, and rocky islet, lying off the mouth of a cove full of rocks 5 miles S.W. of Lark point. The Lark reef terminates close to the south-westward of the Echafaud, after having trended for 5 miles in a W. by S. direction from its south-east extreme.

CAPE BASQUE is the first mountainous headland south-west of the Saguenay, bearing S.W. ¼ S., 6½ miles from Lark point. It is quite bold, having 20 fathoms close to it.

BASQUE ROAD, between Cape Basque and Lark reef, is a good anchorage, well sheltered by the reef from easterly winds, and by the mainland from all northerly and westerly winds, as far to the southward as S.W. There is plenty of room for many vessels, but the best berth is with Echafaud islet bearing W.N.W., and distant rather less than a mile, where the vessel will be in 10 or 11 fathoms, with clay bottom, and at the distance of nearly half a mile from the 3 fathoms line. Vessels may anchor farther out in 13 fathoms; but the farther out the stronger the tide. At the anchorage we have recommended the tides are not strong, and the holding ground is everywhere very good. There is no anchorage on the north shore to the south-west of this before we arrive at Murray bay, a distance of 28 miles.

CAPE DOGS, 5½ miles S.W. from Cape Basque, is quite bold, high, precipitous, and of bare granite. Half way between these capes is the Bay of Rocks, having an island and many large rocks in it, as its name implies, and affording shelter only to boats.

CAPE SALMON is high and bold, like Cape Dogs, from which it bears S.W. 9¾ miles. Between these Capes are Shettle Port, Black river, and Port Parsley, at the distances of 2½, 4⅝, and 7½ miles respectively from Cape Dogs. They are merely places for boats.

CAPE EAGLE is 5¼ miles S.W. by W. ¼ W. from Cape Salmon, and of the same bold, high, and precipitous character. The bay between these capes is a mile deep, but affords no anchorage for shipping in consequence of the great depth of water. In it is Port Salmon, a small cove which large boats can enter at high water, situated about 1½ miles to the westward of Cape Salmon. The settlements on the north shore are beginning to spread to the eastward of this place, and they are continuous from it all along the coast to Quebec.

MURRAY BAY, 6½ miles W. by S. from Cape Eagle, is about 1½ miles wide and nearly as deep; but it is all dry at low water, excepting the very shallow channels leading to the river at its head. The river is rapid and unnavigable, flowing down a beautiful valley from two or three small lakes among the hills. There are not many places in Canada that can be justly compared with this for beauty of scenery. There is a church and village round the head of the bay, and the settlements extend some miles back from the St. Lawrence. There are grist and saw mills on the river. At the latter deals are made, and are for the most part shipped to Quebec in small schooners, which lie aground near or in the entrance of the river; occasionally, however, vessels anchor off, and take in cargoes of lumber. Recently a pier has been constructed here, having 18 feet of water at its end in the lowest tides.

Slight shocks of earthquakes are not infrequent at Murray bay, and also at Eboulemens, St. Pauls bay, and the neighbourhood.

ANCHORAGE.—The anchorage off Murray bay is close under the high rocky shore, a little to the eastward of the bay, with Pique point, its east point, bearing W. by N. distant about 4 cables; Gaze point, its west point, S.W. ¼ W., and Heu point E. by N. ¾ N. The bottom is of clay, good for holding, and the depth 10 or 12 fathoms at the distance of about 3 cables from the shore, but not above a quarter of a mile from the edge of the shoal water. Vessels here will be out of the strength of the tides, well sheltered from the prevailing winds, and in safety if well moored, although inconveniently near the shore except in the case of a vessel taking in her lading. It is possible to anchor a little farther out in 15 or 16 fathoms, but the tides are there very strong.

DIRECTIONS.—In running up from the eastward to anchor in Murray bay, give the shore a berth of a third of a mile, in order to avoid the shoal water which extends nearly a quarter of a mile off shore half way between Cape Eagle and the anchorage. In running down from the westward, keep Cape Sain, the first point westward of Pique point, just open to the southward of the latter, in order to clear the edge of the shoal water which fills Murray bay; and when the church bears N.W., a vessel may haul in towards the anchorage.

GOOSE CAPE is bold and rocky, and about 9½ miles S.W. ½ S. from Pique point, the west point of Murray bay. At Mal bay, and in Little Mal bay, between those two points, the shoals dry out a quarter of a mile from the shore, but there is no good anchorage.

CAPE MARTIN, the east point of Eboulemens bay, is 3 miles W. by S. from Goose cape. The shore between them is very slightly indented, and

the shoals dry out about a quarter of a mile, that is, nearly to a line joining the two capes. Nearly half way between these, but rather nearer Goose cape, a stream descends a ravine, and off the mouth of the latter there is a very large boulder stone called Grosse rock. A landing pier has recently been constructed at Eboulemens having 9½ feet water at its extreme end in the lowest tides.

ANCHORAGE.—The anchorage between Capes Goose and Martin is good, and well sheltered from easterly winds. It must be remembered, however, that the tides will be found rather strong if the vessel be anchored farther out than is recommended, whereas in the proper berth both streams are of moderate strength. When at anchor too far out in 8½ fathoms, with only a neap tide, the strength of which was, however, aided by an easterly wind, the first of the flood was observed coming round Goose cape with a great rippling. At first it set slanting on the shore at the rate of 5 knots, but soon decreased to 3½ knots. About an hour from its commencement the stream increased again to 4½ knots, and after continuing at that rate only for a short time, decreased to 2½ knots, which rate it retained for the remainder of the tide, setting fairly along shore. Farther out still, that is, in 10 fathoms, the ebb also will be found strong as well as the flood.

To avoid these strong tides, anchor in 7 fathoms, with Grosse rock above mentioned bearing N. by W., and Cape Corbeau, the east point of St. Pauls bay, only just shut in behind Cape Martin, bearing W. ¼ S. Here a vessel will have good holding ground, and will be about 4 cables distant from the shore at high water, but only half that distance from the 3 fathoms edge of the shoals. Small vessels anchor farther to the eastward, close in under Goose cape, which bears from the anchorage recommended E. by N. ½ N. 1½ miles. Mount Eboulemens is about 3 miles to the northward of that anchorage, and one of the highest summits on the northern shore of the St. Lawrence, being 2,547 feet above the high water in ordinary springs.

The east end of Coudres island bears from Cape Martin S.W. by S. 2¾ miles.

NORTH CHANNEL,

BELOW COUDRES ISLAND.

GENERAL OBSERVATIONS.—The channel to the northward of Red islet and its bank, and between the latter and the shoals off the Saguenay river, is 3¾ miles wide, from 3 fathoms to 3 fathoms, and with very deep water between. Farther westward, the North channel is much wider. excepting in one place, and even there it is nearly 3½ miles in breadth. Thus, between Cape Dogs and Hare island it is 4 miles wide; between

Cape Salmon and the Hare island bank it is 3¼ miles wide, and this is the narrowest part of the channel. About 5 miles farther to the westward, the islands and banks, which divide the river into two channels, cease for a time. Thus, between Cape Eagle and the east end of Grande island, Kamourasca, there is but one channel, 7¼ miles wide; the line from the Cape to the east end of the island passing the western extreme of Hare Island bank in 5 fathoms.

The river continues thus clear from detached shoals, and with deep water from side to side, for a distance of 6 or 7 miles, or until we arrive opposite Murray bay, which is opposite to Cape Diable on the south shore, and distant from it 10½ miles. A line drawn from the east point of the bay to that cape will pass over the north-east extreme of the English bank in about 11 fathoms, and to the westward of this line the river may be considered as again divided into two channels by the English bank, although there is water enough over the latter for the largest ships until it joins the Middle ground about 3 miles below the buoys of the Traverse. The breadth of the St. Lawrence between Goose cape and Ouelle point is nearly 8 miles, but the navigable breadth is diminished by the Shoals of St. Anne to 5 miles.

The North channel from Red islet to Coudres island has a depth of water usually exceeding 30 and sometimes 50 fathoms; it therefore affords no anchorage excepting those which we have described in the last Section. A vessel, however, might anchor on the north side of the Hare Island bank, and the English bank is common to both channels, but it is only in fine weather that vessels could ride in such exposed situations. In time of need a vessel may also anchor all along the north side of Hare island and White Island reef, but the ground is generally bad, and the vessel, in consequence of the deep water, must be too close in shore for safety, especially in the event of a strong north-west wind occurring.

It is this want of good and convenient anchorages which renders this part of the North channel unfit for general use. In the South channel, a vessel above Cacona can anchor almost anywhere, or at any time when it may become necessary; but in the North, in the event of its falling calm, she would be left at the mercy of the strong tides, and might be in danger of being set on shore if she were in the neighbourhood of Red islet or the shoals off the Saguenay. In other respects the North channel is a fine, wide, and straight channel, entirely unembarrassed by detached shoals, and therefore there seems no reason why it should not be used occasionally when circumstances may render it advantageous to do so; as in the case of scant and strong north-west winds likely to continue, as they generally are in the fall of the year, and when it would be, for obvious reasons, desirable to keep the north shore aboard.

With easterly winds and thick weather, or at night, this channel should never be attempted; for as the leading marks could not then be seen, and the soundings are too deep and irregular to supply the requisite guidance, a vessel would be very likely to meet with a fatal accident under such circumstances. Besides the meeting of the ebb tides down the St. Lawrence and out of the Saguenay, at the rate of 5 or 6 knots, and their opposition to the heavy swell up the Estuary in north-east gales, causes a very heavy breaking sea, which it would be difficult to distinguish from shoal water.

However, supposing the circumstances such as to render it desirable for a vessel to take the North channel, attend to the following directions:—

DIRECTIONS.—If with a strong north-west wind a vessel has kept the north shore aboard until she has passed the Bergeron coves, and if night be approaching, and the flood tide nearly done, endeavour to reach the anchorage 2 or 3 miles to the eastward of Vaches point (page 257), and remain there till daylight. Having sufficient daylight to take the vessel through between Red islet and the shoals off the Saguenay proceed as follows:—

First, with the ebb tide, keep well to windward, running along under the north land at the distance of a mile, until Cacona opens to the westward of Red islet, bearing S. ¼ E. Then steer so as may be necessary to bring the western extremes of the Brandy Pots and White islet in one, and open to the southward of Hare island, bearing S.S.W. ¾ W. Run upon that leading mark, and it will lead clear to the southward of all the shoals off the Saguenay. But that leading mark can seldom be made out, a matter of less consequence than formerly, since buoys have been placed on the shoals off the Saguenay. Therefore, if the mark cannot be seen, steer so as to pass 3 or 4 cables to the southward of the *chequered black* and *white* buoy near the eastern end of the Bar reef, and thence so as to make good a S.S.W. ¾ W. course. When the lighthouses on Red islet and Green island come in one the vessel will be off the south-east extreme of Lark reef, and should not be in less than 6 fathoms at low water.

Continue to run on the same course, or on the same leading mark if it can be made out, or steer so as to pass fully half a mile to the southeastward of the *white* buoy on the south extreme of Lark reef, and about 1¼ miles to the southward of Lark patch of sand and stones which never covers. The lead should be kept going with reference to the soundings in the chart; and when the houses at Tadousac open to the westward of Lark islet, bearing N. by W., the vessel will be off the end of the reef, in from 15 to 20 fathoms water, and may either proceed to the anchorage in Basque road (page 259), guided by the soundings along the west

side of the reef, or may continue her course up the river, keeping well under the north shore with the ebb, and more in the middle of the channel with the flood tide, there being nothing in the way until near Coudres island.

Secondly: Coming up, and having passed Bergeron cove with the flood tide, it is not necessary to keep the northern shore quite so close aboard. Open Cacona to the westward of Red islet, as before directed, and then steer so as to open the Brandy Pots to the southward of White islet, about the breadth of the latter, and bearing S.W. $\frac{1}{4}$ S. Take care to open the Brandy Pots as directed, because the line of those islands and White islet touching, passes nearly over a rocky patch of 7$\frac{1}{2}$ fathoms, which it is as well to avoid, although we do not think that there is less water there. The cross marks for that rocky patch are, Red islet on with the south-west end of Green island; a vessel running on the leading mark which we have given for the case of the ebb tide passes well inside, or to the northward of it.

Having opened the Brandy Pots to the southward of White islet, keep them so as the vessel runs towards them, until Green island lighthouse is well open to the westward of Red islet, when she may steer directly up the middle of the channel between Hare island and the north shore. In the event of the wind and tide failing, anchorage will be found on the Hare island bank, the English bank, Murray bay, and to the westward of Goose cape. For directions for the North channel from Coudres to Quebec, *see* page 293.

TIDES.—This chapter will be closed with a few brief remarks on the tides, which, with the rate and course of the streams, as shown by the arrows on the charts, the times of high water on the full and change days, and the rise and duration of the tides given in the table at page 301 will, we trust, be all that seamen can require on this head.

The principal stream of flood ascends along the northern side of the Estuary. One part of this stream sets from below Bergeron cove towards and over the tail of the Red Islet bank, which it curves round to the southward, and then passes into the North channel between Red islet and the White Islet reef. At the same time an inferior stream of flood ascends along the south shore close outside the Razades, Basque, Apple, and Green islands; and inside of them also after the shoals are covered. When these two streams of flood meet the last of the ebb, and afterwards each other, between Green and Red islands, they cause high breaking ripplings, which can be heard at a great distance on a still night, and which appear like broken water on a shoal. Each of these two streams of flood is strongest near its own side, and there is consequently little or no flood in mid-channel, particularly in neap tides and westerly winds.

To the westward of Cacona the flood in the South channel sets fairly up the river on either side of the Barrett ledges, Middle shoal, and Middle bank; but the strongest part of it passes up the deep water to the northward of these shoals, between them and the Brandy Pots and Hare island; and at the rate of 2½ or 3 knots in spring tides. On arriving at the Hare Island bank, great part of this stream passes into the North channel between that bank and Hare island; the rest over the tail of the bank into the South channel. The flood sets fairly up the South channel, and between the Pilgrims and the Hare Island bank, but becomes very weak above them, especially in neap tides, until we arrive as high as Origneaux point, whence it gradually increases in strength, being aided by a branch of the northern stream from between the English and Hare Island banks, until it attains its full rate of 5 knots in the South Traverse.

To return again to the principal stream of flood: another part of it passes between the Red Islet bank and the shoals off the Saguenay, whilst a third part ascends that river 70 miles to the rapids. When the flood first makes, it meets the ebb down the channel to the northward of Hare island, and causes a tremendous rippling, extending from the Lark reef to Red islet. Above that islet, the stream of flood, after sweeping round to the westward past Rocky bay, pursues a tolerably fair course up the North channel as high as Cape Eagle, off which it divides; the southern part proceeding to the southward of the English bank, on its way to the South Traverse; whilst the northern part passes between the English bank and the north shore up to Goose cape.

Off Goose cape this northern part of the stream of the flood again divides: one, the lesser and weaker part, passing to the southward of Coudres, throws off at the first of the tide branches to the S.S.W., which pass over the western part of the English bank, on either side of the Middle ground, and between the latter and the shoals eastward of the Seal reefs, into the South channel. This seems to arise from the flood being earlier in the North than in the South channel, and hence the first of the flood comes from the N.N.E. at the Traverse, and sets for about an hour on the Shoals of St. Ann and St. Roque. The other and principal part passes between Coudres island and the north shore, where it attains the same rate of 5 knots in spring tides as in the South Traverse.

Little need be added respecting the ebb tide beyond what has already been said in the course of this chapter, and what the arrows in the Admiralty charts express. We may, however, remark generally, that the direction of the ebb stream is always nearly the contrary to that of the flood, excepting between Red and Green islands, and to the eastward of the former. The principal part of the ebb down the North channel, being turned to the south-east by Lark reef, comes through between White Islet reef and Red

islet, setting over towards the east end of Green island at the rate of 5 or 6 knots in spring tides. The ebb out of the Saguenay river is equally strong, and sets over towards the east end of Red Islet bank, whence, curving to the eastward, it unites with the St. Lawrence ebb, from which it can be readily distinguished by the dark colour of its water, and both together set down the Estuary, as has been explained in page 27, and other parts of these directions.

Although the duration both of the rise and stream of the tides will be found in the table at page 301, yet it may be useful to remark here that the flood and ebb are less unequal in duration in the North than in the South channel; and that in both channels the streams of flood and ebb upon an average continue three-quarters and one hour respectively after it is high and low water by the shore.

At the Brandy Pots, the flood rises 5h. 50m. and the ebb falls 6h. 34m., so that the ebb by the shore is about three quarters of an hour longer than the flood. This inequality of the tide increases as we proceed up the river; thus at St. Roque point, opposite the South Traverse, the flood is only 5h. 35m. and the ebb 6h. 50m. The times of the high and low water by the shore do not seem to be much affected by winds; but the amount of the rise and fall of the tides, and the duration of the streams, are considerably affected by strong winds; nevertheless, as an approximation near enough for practical purposes, we may state that, when the stream of flood makes in mid-channel the tide has risen by the shore, at the Brandy Pots 1¼ feet and at the Traverse 2¼ feet; and also that when the stream of ebb makes, the tide has fallen about 2 feet by the shore. But as it is of importance to know the proportional amount of the rise and fall of the tides for any part of their whole duration, when a large ship is to be taken over certain shallow parts of the river above the Traverse, we shall have occasion to notice this subject again in the following chapter.

CHAPTER XI.

RIVER ST. LAWRENCE,—THE SOUTH, MIDDLE, AND NORTH TRAVERSES TO QUEBEC.

VARIATION 17° to 15½ WEST, in 1860.

THE vessel has now arrived at the most difficult part of the navigation of the St. Lawrence, where the river becomes divided into three channels by shoals and islands. The eastern entrances of all three of these channels are rendered more or less difficult, either by their narrowness, the want of good anchorage in them, or by the strength of the tides.*

THE SOUTH CHANNEL lies along the southern shore, and between it and the shoals and islands occupying the central part of the river from the South Traverse to Quebec. This channel is the one generally used, and is preferable to the others for the general purposes of navigation, having excellent anchorage and moderate tides in every part, excepting for a few miles in the Traverse. Now that this channel is buoyed, vessels of the largest draught may ascend by it to Quebec at all times of the tide. Formerly there was always danger of ships of the line or very heavy frigates striking on some of the shallow and rocky patches which abound in the Traverse, especially in its western part, about 3 miles below the Pillars. The channel between Beaujeu bank and Crane island has also been buoyed for the use of such large ships, for scarcely more than 3 fathoms at low water can be carried through to the southward of that bank where nearly all vessels used formerly to pass. Vessels of large draught had occasionally to wait for the tide to pass such shallow parts of the channel, risking the loss of a fair wind and much delay in consequence.

The whole distance, by the South channel from the light-vessel at the Traverse to Quebec, is 55 miles.

THE MIDDLE CHANNEL lies between the shoals and islands which form the northern side of the South channel and the long line of shoals and reefs which extend from Coudres island to Reaux island. In one part of it, near the eastern entrance of the Middle Traverse, there are not more than 3 fathoms at low water. Having passed this shallow part, there is

* *See* Plans :—River St. Lawrence, below Quebec, Sheets V., VI., and VII., Nos. 315, 316, 317 ; scales, *m* = 1 inch : and North and Middle Traverses, with Views, No. 318 ; scale, *m* = 2 inches.

both room and water enough for the vessels of the largest draught, until they arrive at the group of islands between Crane island and the isle of Orleans, where the Middle channel communicates with the South channel by various narrow passages between the islands. There is plenty of water in most of these passages at all times, but the tides set strongly through them; and, although they might be rendered available in case of necessity, and though it would be possible to take even the largest vessels up to Quebec by the Middle channel, were it requisite from any cause to do so, yet they are too intricate and difficult for general navigation. The other and better channels will always be preferred for general use; nevertheless, the Middle channel ought to be known to the pilots in common with every other channel in the river.

The Middle channel was unknown before the Admiralty survey. It was probably known to the French, but, if so, their knowledge had been lost; for even in the most recent of the old charts and directions, the Seal reefs are represented as extending to Coudres island, and the islands between Crane island and Reaux island as being joined together by shallow water.

The NORTH CHANNEL stretches along the high northern shore of the river, inside Coudres island, and of the line of shoals which extend from the latter to the Neptune rock and the Burnt Cape ledge, and from thence through the North Traverse between the shoals which reach from the Burnt Cape ledge nearly to Reaux island, and those which lie off the north-east end of the isle of Orleans. From the North Traverse this channel continues between Reaux and Madame islands on the one side, and the isle of Orleans on the other, till it unites with the South channel opposite St. Vallier.

The North channel, as just described, was formerly in general use, but it is now little known to those pilots who have not been required to qualify themselves for taking ships through it. It has been very much misrepresented in former books of directions, wherein the objections to it are, for the most part, either exaggerated or imaginary. If a light were placed on the west point of Prairie bay, in Coudres island, and if the North Traverse were properly buoyed and lighted, this channel would be of far easier navigation for large ships than the South channel; for it is much wider and less embarrassed by shoals in every part, excepting in part of the North Traverse, which is narrow and intricate; but with this great advantage over the South Traverse, that there is good anchorage in every part of it, and tides of comparatively moderate strength; neither is there any want of anchorage in other parts of the North channel, excepting in the middle of it, where in general the tides will be found too strong. Between Coudres island and the main the water is so deep, and

the stream so strong, that there is no anchorage, excepting in Prairie bay, which is an excellent roadstead (page 294).

Above Coudres there is a fine straight channel from 1¼ to 2½ miles wide, entirely free from danger, and extending 18 or 19 miles to the Burnt Cape ledge. The water is not (as has been represented) inconveniently deep anywhere above Coudres; it nowhere exceeds 17 fathoms at low water in mid-channel, and is generally not above 11 or 12 fathoms, shoaling towards the sides of the channel, so as to afford good anchorage out of the strength of the tides. There is, however, much more tide and more sea in this long and open reach of 6 or 7 leagues than in the corresponding parts of the South channel; and in the fall of the year, the north-west squalls off the mountains are heavy and frequent. Altogether, the South channel is preferable for the general purposes of navigation; yet the North is a fine channel, and, as it frequently remains open, that is, free from ice, some time after the South channel becomes unnavigable in the fall of the year, it becomes the more requisite to require a full knowledge of it from all pilots in future.

The ORLEANS CHANNEL, to the northward of Orleans isle, has water enough for vessels of the largest draught, but it is too narrow and intricate for general use.

Having thus generally noticed the three channels into which the St. Lawrence is divided, a particular and full description will be given of that which is in general use: and afterwards notice more fully the North channel.

SOUTH CHANNEL,

THROUGH THE SOUTH TRAVERSE TO CRANE ISLAND.

The south shore of the St. Lawrence, from St. Roque point to St. Thomas, is low, and of slate, but rises gradually into wooded ridges of considerable elevation at the distance of a few miles back from the river. These ridges are of greywacke and slate rocks, and are not to be compared in height to the granitic mountains of the north shore opposite, which in some parts exceed 2,000 feet above the river. The houses are numerous all along the south shore, and are grouped into villages round the churches of St. Jean, Islet, St. Ignace, and St. Thomas, where supplies may always be obtained. A landing pier, 1,200 feet long, has recently been constructed at L'Islet, having 8½ feet of water at its end in the lowest tides. The churches of St. Roque, St. Jean, and L'Islet stand low down near the water's edge, and are distant nearly 7 miles from each other, the latter being opposite to Goose Island reef. The river Jolie is 2¾ miles above or to the westward of the church of St. Jean; and the

river Trois Saumons a mile farther in the same direction. They both afford shelter to small craft, and good landing for boats, excepting at low water, and they have 12 feet water in their entrances at high water springs. The church of St. Ignace is 13½ miles to the westward of that of St. Jean, and stands about three-quarters of a mile back from Cape St. Ignace, a small, round, rocky peninsula, which will be easily recognized, and is nearly opposite Macpherson house, on the east end of Crane island. The church of St. Thomas, which is very large, and stands on the western bank of the river Sud, is 5⅞ miles to the westward of that of St. Ignace, and nearly opposite the west end of Crane island. The river Sud falls into the St. Lawrence, by a cascade of 30 feet just within its entrance, and has mills and a considerable village on its banks.

The SOUTH BANK extends out from the shore to considerable distances all the way from St. Roque to St. Thomas.

SHOALS of ST. ROQUE are that part of the South bank which projects 4 miles out from St. Roque point to the light vessel and buoys of the Traverse, and is extremely dangerous, being composed of a thin covering of sand, mud, and stones over slate rock. The depth of water in many parts of these shoals does not exceed 9 or 10 feet.

NARROWS of the SOUTH TRAVERSE are between the Shoals of St. Roque and the Middle ground, and are less than half a mile wide from the depth of 3 fathoms to 3 fathoms. The depth of water through the Narrows is from 5 to 14 fathoms. The ebb-tide runs at the springs at the rate of 7 knots, and the flood 5 or 6 knots; and, as the ground is hard, there is no anchorage in the stream. It is there that a light-vessel and buoys have been placed. Their positions used formerly to be uncertain to the extent of 2 or 3 cables in different years, but that has now been remedied by the erection of beacons. The want of good leading marks, and the strong tides, renders the light-vessel and buoys indispensible for the safety of large vessels in this difficult part of the navigation of the St. Lawrence.

The LIGHT VESSEL is moored in about 3½ fathoms water on the north-east point of the Shoals of St. Roque, nearly in the line from St. Roque church to the north-east end of Coudres island; the former bearing S.S.E., 4⅛ miles, and the latter being distant 4⅞ miles. It exhibits a *fixed white*, which, in clear weather, should be seen from a distance of 9 miles. The beacon at St. Roque, open its own breadth to the westward of St. Roque church, forms a cross mark for insuring the position of this light, the beacon being to the southward of the church. A gong is struck every five minutes on board the light-vessel in snow storms and foggy weather.

BUOYS.—Three *black* buoys are placed on the northern edge of the Shoals of St. Roque, marking the southern edge of the South Traverse. They are moored in 2¼, 3½, and 3 fathoms water, and at the distances of nearly 1, 2½, and 4¾ miles respectively above the light vessel,—the last buoy being on the south-west point of the Shoals of St. Roque. The opposite or northern side of the Narrows is shown by the two *red* buoys, moored in 2½ and 3 fathoms water on the southern side and south-west end of the Middle ground.* It may, however, be useful to add here, that the *red* buoy on the south-west end of the Middle ground lies on the line of the Wood Pillar island and Goose island touching, and with the two beacons at St. Roque in one; the south-easternmost beacon being diamond shaped.

There is no mark for leading through the Narrows; and that which leads up to them from the eastward, viz., Cape Origueaux and the high land of Kamourasca,† can only be made out in clear weather. The western leading mark given in the old directions, that is, the Wood Pillar just touching the south point of Goose island, must never be trusted. This mark will not lead through; and, moreover, Goose island is so distant that more or less of it becomes invisible according to the state of the weather or the atmosphere. On the weather-tide, however, the channel is pretty well marked out by the rougher or breaking sea in the deep water, as compared with the smoother surface over the shoals on either side.

The edge of the South bank above the Narrows is not quite so steep or shoal, but it has many outlying patches of from 2¼ to 3 fathoms off it, which render it difficult to run a vessel of large draught safely along it by the lead, excepting within 2 hours on either side of the time of high water by the shore. On one of these patches, 2 miles above the *black* buoy on the south-west point of the Shoals of St. Roque, a fourth *black* buoy is moored, with the high rock on Goose Island reef just shut in behind the south point of the Stone Pillar, and the sugar loaf beacon in one, with St. Jean church bearing S. by E.

CHANNEL PATCH lies directly in the way of vessels, and in the deepest part of the channel. Its position is pointed out by a *chequered black* and *white* buoy, which lies with the north sides of Goose Island reef and of the Stone Pillar in one bearing S.W. ¼ W., the latter being distant 2¾ miles; and with a diamond shaped beacon in the parish of St. Jean open to the westward of St. Jean church bearing S.E. ½ S.

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* For the marks and beacons for placing these buoys, *see* Position of Buoys and Beacons, page 316.

† *See* View K on chart.

BANK of ST. THOMAS is that part of the South bank which extends rather more than 2 miles off shore at the village of St. Thomas. It consists of sand, mud, and stones, and is dry at low water nearly to its northern edge, which is very steep; and the marks for leading to the northward of it are, Belle Chasse island and St. Vallier point touching. Therefore the whole of the island should never be opened out clear to the northward of the point; but these marks can only be made out in very favourable weather, a defect which is now remedied by the *black* buoy on the north extreme of the bank, in 3 fathoms, and from which Haystack island appears in one with the west extreme of Crane island; and the red sugar-loaf beacon and the white-diamond beacon on the south point of Crane island, are also in one. But before arriving thus far, the dangerous Beaujeu bank has to be passed, for which, and the buoys on and near it, *see* pages 274, 275.

The northern side of the South Traverse is formed of shoals from the north-east end of the Middle ground to the Seal islands and the Pillars, a distance of 13 miles; for, although there are some 3-fathom passages between the Middle ground and the shoals to the westward of it, and also between the Seal islands and the Pillars, yet they are neither used nor required for the general purposes of navigation; and those last named are so narrow as to be almost unnavigable.

The MIDDLE GROUND extends nearly 3 miles to the north-east of the easternmost *red* buoy of the Traverse; and there is as little as 3 feet water at low spring tides on this eastern part of the shoal, which is of sand and slate rock. To the south-west of that buoy, in which direction the Middle ground, including two detached patches, extends $1\frac{8}{10}$ miles, there is not a less depth than $2\frac{1}{2}$ fathoms.

On the shoals to the westward of the Middle Ground there is as little as $1\frac{1}{4}$ fathoms water; and the slate rock dries in patches more than 3 miles out to the north-east of the Seal islands. The outline of these shoals is extremely irregular, and there are several detached shoals to the southward of them, with 2 to 3 fathoms, as will be seen in the chart. There are no marks for leading clear of them, and the soundings are too irregular to be a sufficient guide; hence the northern side of the Traverse is rendered dangerous, and should not be made too free with, especially in a vessel of large draught.

SEAL ISLANDS consist of sand upon slate; they are small and very low, partly covered with grass and a few bushes. They are occasionally visited by the "habitans" for seals, marsh hay, and wildfowl, in their seasons. A vessel of large draught can only approach near to them

by way of the Middle Traverse, where she may lie within half a mile of their north-west side.

The PILLARS are two small and steep islets of greywakè rock, neither of them exceeding 2 cables in diameter.

The Wood Pillar which is 100 feet above high-water mark, has trees upon it, and is the highest and steepest of the two ; it lies S. by E. $2\frac{1}{2}$ miles from the Seal islands, and N.E. 2 miles from Goose island. A shoal extends from the north-east point of the latter to it, and continues $2\frac{1}{2}$ miles farther to the north-east.

The Stone Pillar lies $1\frac{1}{4}$ miles to the eastward of the Wood Pillar, and is quite bare of trees. Shoal water extends from it a mile to the north-east. There is a half-tide rock, called the Middle rock, between the Pillars, and a passage too intricate for any but small vessels.

LIGHT.—The lighthouse erected upon the Stone Pillar islet, stands about 100 yards from its south point, and 25 feet above high water. The tower is of gray stone, of a conical form, 20 feet in diameter at the base, and 38 feet in height. It exhibits, at an elevation of 68 feet above high water ordinary springs, a *white* light which *revolves* every *minute* and a *half*. It is of the first order, and can be seen in the ordinary state of the atmosphere from distances of about 13, 18, or 20 miles, according as the observer's eye above the sea may be elevated 10, 50, or 100 feet respectively.

SOUTH ROCK, lying S.E. by S. a quarter of a mile from the south-east point of the Stone Pillar, is of slate rock, about 100 yards in diameter, dry soon after half-ebb, and bold all round. This rock lies much in the way of vessels, and at night, or when it is covered, becomes very dangerous. The passage between it and the Pillar is too narrow for use, but the marks for leading to the southward of it are, to keep the whole of Crane island open to the southward of the Goose island reef.

GOOSE ISLAND REEF is composed of a long chain of rocks, commencing $1\frac{1}{3}$ miles S.W. of the Stone Pillar, and extending $3\frac{2}{3}$ miles in that direction, or parallel to the course of the river. The central part of this reef, nearly $1\frac{1}{2}$ miles long, is formed of large and high rocks, always above water, and to be seen from a great distance. There is a narrow channel only fit for small craft, between it and the north-east end of Goose island, to which it lies parallel, at the distance of a long half mile. It is bold to the southward, on which side vessels may safely approach it to the distance of 2 cables' lengths.

GOOSE ISLAND is $4\frac{1}{2}$ miles long, partly composed of rocky and hilly ground, and partly of meadow land. The eastern part, $2\frac{1}{2}$ miles long, is

the highest, and about 150 to 200 feet high. On the shoals, which dry out from the island at low water, on its south side, lies the Hospital rock, out of the way of vessels, but serving to point out one of the few places in the St. Lawrence, where vessels could be laid on shore in case of necessity; for instance, to winter safe from the ice. In that part of the bay, between Goose and Crane islands, which is included between the distances of half a mile and 2 miles to the south-west of the Hospital rock, the bottom is fit for that purpose, being of mud, dry at low water.

CRANE ISLAND is joined to Goose island by meadows, and distant from its nearest point about $2\frac{3}{4}$ miles. It is $3\frac{1}{2}$ miles long, and not quite so high as Goose island. Macpherson house and other buildings will be easily recognised near its north-east end; and there is a village with a church on the north side of the island, but the church cannot be seen from the eastward. The island rises into a ridge of greywacke and slate immediately to the south-west of Macpherson house; and all its south-west part is thickly wooded. The meadows of Goose and Crane islands feed great numbers of cattle; they can be seen over from the deck of a vessel; and the mountains of the north shore thus seen, together with the islands themselves, form one of the finest views of the St. Lawrence.

BEAUJEU BANK is a narrow shoal of sand and gravel over slate. It is 2 miles long, parallel to the course of the river, and has not more than 8 feet at low water over some parts of it. Its west end approaches to within less than half a mile of Crane island at Macpherson house, from which it bears S.S.E. $\frac{1}{2}$ E., being directly in the line from the house to Cape St. Ignace.

CHANNEL SOUTH of BEAUJEU BANK.—This channel is that which was generally used by vessels; the depth in it is irregular, varying from 5 to 3 fathoms; and there are two rocky patches of $2\frac{1}{2}$ fathoms in the way, and difficult to avoid; so that the latter depth is all that could be carried through there without buoys at low spring tides, unless the vessel were conducted by an unusually skilful pilot, in which case 3 fathoms might be reckoned upon.

The marks for passing the southern edge of Beaujeu bank, along the eastern half of its length are, the Stone Pillar, its own breadth open to the southward of Goose Island reef; and for the western part of the bank, which turns up slightly to the northward towards Crane island, St. Vallier point in one with the south side of Crane island. But these marks, from their great distance, can seldom be seen, and hence the necessity for buoying this difficult part of the channel, which has now been done as follows:—

BUOYS.—The first *white* buoy is on the eastern end of the 2½ fathoms patch, next eastward of the Beaujeu bank, in 3 fathoms at low water, with the south side of Crane island bearing S.W. by W. ½ W., and the beacon on the meadows of Goose island in one with the centre of Onion island. The second *white* buoy is on the western end of the Beaujeu bank, in 3 fathoms, with the lighthouse on the Stone Pillar appearing open two or three sails' breadth to the southward of Goose Island reef, and the two white beacons on Crane island in one.

These buoys are of the greatest assistance to vessels passing to the southward of the Beaujeu bank, whilst the channel to the northward of the bank is between them and two *red* buoys, which are placed as follows:—The easternmost *red* buoy, in 4 fathoms water, is moored on the edge of the Goose Island shoal, with Onion island seen over the meadows, bearing N.W., and the south side of Crane island S.W. ½ W. The eastern entrance of the channel to the northward of the Beaujeu bank, between this buoy and the easternmost white buoy, is half a mile wide, with 9 or 10 fathoms water in it, but the depth decreases to 4½ fathoms in the western entrance, which is only about 2 cables wide, from the depth of 3 fathoms to 3 fathoms. A second *red* buoy on the shoal, which extends 3 cables out from the high-water mark of Crane island, marks the northern side of this narrow entrance, which is between it and the white buoy on the western end of the Beaujeu bank. The marks for this second red buoy are, St. Ignace church touching the eastern side of the peninsula of Cape St. Ignace, and Macpherson house bearing N. ½ E.

Farther westward, the south side of Crane island is so bold that it may be approached to the distance of 2 cables; and the channel between it and the Bank of St. Thomas is three-quarters of a mile wide, and free from danger.

CAUTION.—Ships of large draught, of the line, or heavy frigates, should not attempt the South Traverse without a settled fair wind; for, although it might be possible to back and fill through the Narrows in the day-time, and with fine weather, yet it would be attended with so much risk that it should never be attempted excepting in a case of urgent necessity They should also choose their time of tide, so as to have water enough to pass over the patches of shallow water mentioned in page 271, and in the preceding pages. But now that the channel has been sufficiently buoyed, these precautions are less absolutely necessary.

TIDES.—The rise and fall of the tide, for every hour after low and high water, will be seen in the table at page 301, and from it the depth of water at any time, over any shallow part of the river, may easily be deduced. Moreover, such large ships should not run through the Traverse

at night, especially if the weather be bad, and so dark that the buoys and the land cannot be seen; for although the bearings of the light and the lead might enable a skilful and experienced pilot to take such ships safely through on the last half of the stream of flood, yet it would be a heavy charge, and attended with some risk. It is desirable for vessels in general coming up the river, even with a fair wind to pass the Traverse on the flood-tide; for the ebb is so strong between the buoys, that little progress will be made against it, even with a strong breeze.

DIRECTIONS for SOUTH TRAVERSE.—A vessel coming up the river with a fair wind, and having arrived off the St. Anne buoy, in from 7 to 10 fathoms, as directed at page 257, should proceed as follows:—The light-vessel will bear S.W. by W. nearly 5 miles; but the course to be steered will vary on either side of that bearing, according to the tide. The first of the flood will set to the southward, towards the Shoals of St. Roque, and the ebb in the contrary direction; the mariner must therefore be guided by the bearing of the light-vessel, but more especially by the soundings in the chart.

Keep the southern side of the channel aboard, but do not go into less than from 7 to 10 fathoms water according to the time of tide, until up to the light-vessel, lest the ship get into the shallow inlet in the Shoals of St. Roque, which runs in to the southward of the light-vessel and *black* buoy. In passing the light-vessel steer S.W. by W. $\frac{1}{4}$ W. leaving her to the southward, and at the distance of 1 or 2 cables. Run past her about a quarter of a mile, and then steer S.W. $\frac{1}{4}$ W., or as may be requisite from wind and tide, to pass midway between the buoys, from whence the course to the Stone Pillar is S.W. $\frac{1}{4}$ S. But here, too, the course alone must not be trusted, for there is no calculating exactly the set of the tides. Generally a vessel will have to steer a little to the southward of S.W. $\frac{1}{4}$ S. with the flood-tide, to keep along the edge of the South bank; and with the ebb a little to the westward, but the lead and the buoys are the only sure guides.

As soon as the two first buoys are past, haul gradually to the southward so as to bring the light-vessel to bear between N.E. and N.E. $\frac{1}{2}$ N., or till the southern side of the channel is approached to 5 fathoms at low water, or to a depth corresponding to that at other times of the tide, *see* page 301. When the vessel is 3 miles past the light-vessel, she will have passed between the next two buoys, and beyond the south-west patches of the Middle ground, and will consequently have more room. Take now 6 fathoms at low water, or a depth corresponding to it at other times of the tide, as a guide along the edge of the South bank, keeping the light-vessel bearing N.E. $\frac{1}{2}$ N. until past the *black* buoy on the south-west point of the Shoals of St. Roque, and taking care not to cross to the northward

of the line of deep water (9 to 13 fathoms), which extends south-westward from the Narrows all through the Traverse. The patches off St. Jean church will be avoided by passing 2 or 3 cables to the northward of the *black* buoy on them, or by not going to the southward into less water than has been directed, if the buoy cannot be seen. If the *chequered black* and *white* buoy on the Channel patch can be seen, pass a cable's length to the southward of it; if not seen, run along the edge of the South bank in the depth before directed, until St. Jean church bears S.S.E.; then open the south side of Goose Island reef, only just sufficiently to be seen nearly in one with the south side of the Stone Pillar, (the lighthouse on the latter at the same time bearing nothing to the southward of S.W. by W. $\frac{1}{4}$ W.), and run upon that leading mark until St. Jean church bears S.E. $\frac{3}{4}$ S., when the vessel will be about $1\frac{1}{2}$ cables to the southward of the Channel patch, and should sheer again to the southward, and follow the edge of the South bank in the same depth as before; remembering, that the marks for clearing the South rock are, the whole of Crane island open to the southward of Goose Island reef. When the lighthouse on the Stone Pillar bears N.N.W. the South rock will have been passed.

If wishing to sail to the northward of the Channel patch—having brought St. Jean church to bear S.S.E. as before, haul to the northwestward, until the whole of Goose Island reef is distinctly open to the northward of the Stone Pillar; the lighthouse on the latter bearing nothing to the westward of S.W. Run upon the marks just given, and they will lead about $1\frac{1}{2}$ cables to the northward of the *chequered* buoy, on the Channel patch. As soon as St. Jean church bears S.E., steer immediately to the southward towards Port Jolie, to avoid the shoal water which extends north-eastward from the Stone Pillar. Continue to run to the southward until far enough to insure clearing the South rock, as before directed. Having passed the South rock, the channel is clear, and the edge of the South bank easily followed by the lead at night, until more than 2 miles past Goose Island reef.

To PASS SOUTH of BEAUJEU BANK, proceed as follows, remembering that there will not be water enough for a vessel of heavy draught until after half flood. As soon as the vessel is $1\frac{1}{2}$ or 2 miles past Goose Island reef, steer so as to bring the Stone Pillar (distinguished by its lighthouse), its own breadth open to the southward of Goose Island reef, bearing N.E. $\frac{3}{4}$ E. Run from those marks, steering about S.W. $\frac{3}{4}$ W. or so as to keep them open as just described, and they will lead up to the *white* buoy on the patch next eastward of the Beaujeu bank. Pass close to the southward of that buoy, still steering about S.W. $\frac{1}{2}$ W., or as may be required to keep the Stone Pillar rather more than its own breadth open

to the southward of Goose Island reef, until St. Vallier point opens to the southward of Crane island about a quarter of a point, bearing W.S.W.; then haul up for St. Vallier point, keeping it so open until Macpherson house on Crane island bears N.N.W. when the vessel will have passed about 2 cables to the southward of the *white* buoy on the west end of the Beaujeu bank, and may keep away to the southward, so as to run along the southern shore of Crane island at the distance of not less than 3 cables, or in from 7 to 10 fathoms water, according to the time of tide.

To PASS NORTH of BEAUJEU BANK.—as soon as the vessel is above the Hospital rock, or west end of Goose island, bring the south sides of the Goose Island reef, and of the Stone Pillar in one, and run from and upon that mark, and it will lead between the *red* buoy on Goose Island shoal, and the *white* buoy on the patch next eastward of the Beaujeu bank. The buoys at the western entrance of the channel, being distant only 2½ miles, will probably be now seen right ahead, in which case, steer so as to make a straight course towards the *red* buoy, until within the distance of a cable from it, then haul to the southward, so as to pass midway between it and the *white* buoy on the west end of the Beaujeu bank, until St. Vallier point opens out to the southward of Crane island, when the vessel may be hauled to the westward, along the southern shore of Crane island as before directed.

If, after passing the *red* buoy on the Goose Island shoal, the upper *red* buoy should not be immediately seen, continue to run from and upon the mark above given, taking care not to open out the south side of the Stone Pillar to the southward of Goose Island reef, and as soon as the buoys can be seen, steer for the *red* buoy, and proceed as already directed. The mark formerly given, for passing to the southward, between the west end of the Beaujeu bank, and the shoal to the westward of it extending 3 cables from the high water mark of Crane island was, the north-east end of the high water beach of Crane island and the north-east end of Onion island in one, bearing North; but this in any case would not have supplied the want of buoys, and was moreover often useless, from the difficulty of making out the end of the beach when covered with reeds.

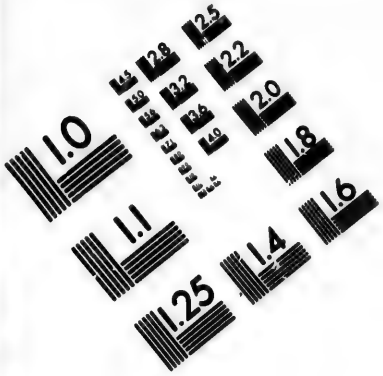
At Night, the Beaujeu bank must be passed by the lead, along the edge of the South bank, or southern side of the channel, keeping in 3 fathoms at low-water or a depth corresponding to it at other times of the tide, till Macpherson house bears N.N.W., when the vessel must be hauled up for the west end of Crane island.

With BEATING WINDS.—Coming up with beating winds, tack by the lead in 6 fathoms water on the south side of the channel below the light-vessel, but go no nearer than 10 fathoms to the Middle ground, which is very steep. In passing the Narrows the water will be observed rough in the

channel, or even breaking with a strong breeze against the tide, while it is comparatively smooth upon the shoals on either side. This circumstance, the lead, and the bearing of the buoys, must guide a vessel in the very short boards which she must make through the Narrows. Keep more over towards the south than the opposite side of the channel, especially in light winds, for the St. Roque shoal is less steep than the Middle ground, and therefore affords better warning by the lead, and a better chance of coming to an anchor in case of necessity; and in no other case should anchoring there be attempted. In the event of its falling suddenly calm, boats ahead will generally enable a vessel to keep the channel till the tide shall have carried her into a situation where she may more safely anchor.

When above the Middle ground a vessel will have more room to work in, and may stand to the southward into [illegible] at low water; but in the board to the northward she should tack [illegible] first shoal cast of the lead after passing the line of deep water ([illegible] 13 fathoms), which extends from the Narrows towards the Pillars, and which is generally shown by rougher water than there is elsewhere. Beware of the South rock, and in standing towards it at night from the South bank, tack at the first cast of deep water, that is 10 or 11 fathoms. Nine fathoms is near enough to the Goose Island reef by day, and 10 fathoms by night. Tack at the former depth all along Goose island, taking care not to get to the northward of the Beaujeu bank, along the southern edge of which a vessel may tack when the marks given in page 274 for its southern edge are seen coming on. In the night there is no other guide for beating past the Beaujeu bank but the lead; and a vessel must tack from the edge of the South bank in 3 fathoms at low water, or a depth corresponding to it at other times of the tide, making short boards towards the Beaujeu bank, which must be approached with great caution, since its southern side is extremely steep, having from 4 to 5 fathoms at low water close to it. In beating through between Crane island and the Bank of St. Thomas remember that the latter is extremely steep. The helm should be put down at the first indication of a less depth than 5 fathoms at low water. See also the leading marks in page 272. A good sailing vessel with a moderate breeze will beat from the St. Anne buoy to Crane island in one spring-tide; but in neap-tides she probably would not get far above Islet church.

ANCHORAGE in SOUTH TRAVERSE.—Vessels may anchor off the Shoals of St. Anne in 6 fathoms low water up to within a mile or two of the light vessel. The ground is better, and there is less tide than on the tail of the Middle ground; but the latter is the better position for weighing with the first of the flood in northerly winds. Vessels do occasionally anchor for a tide, in fine weather, on the edge of the Bank of St. Roque,



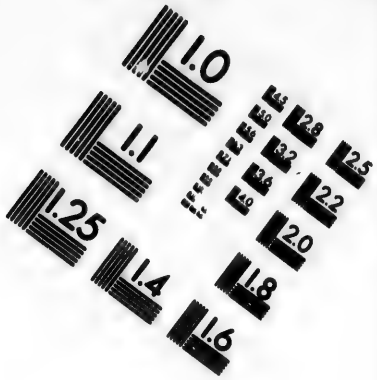
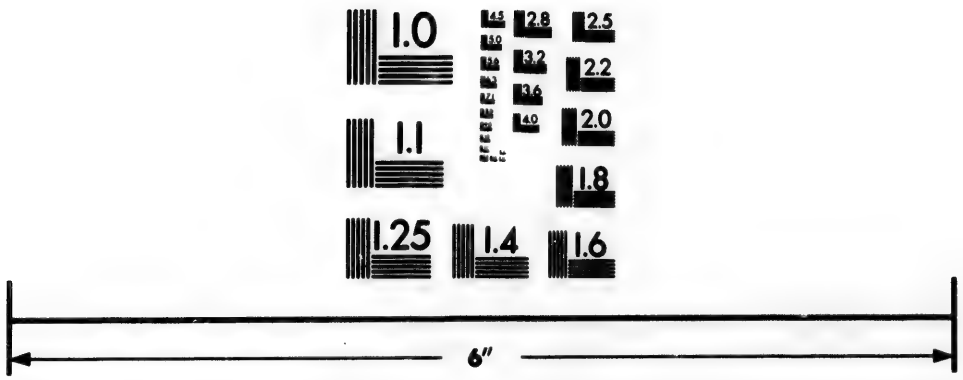


IMAGE EVALUATION TEST TARGET (MT-3)



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2 or 3 miles above the light-vessel; but this cannot be recommended, for the ebb-tide runs there at the rate of 6½ knots, and the ground is not to be depended on; hence, if the anchor once started, it would be difficult to bring up again, and there would be great danger of losing the anchor. Should the wind begin to fail, or the flood be done, it would be better to run down below the light-vessel than to anchor anywhere at a less distance than 4 miles above the light-vessel.

Vessels often anchor off the black buoy on the south-west point of St. Roque shoal in 6 or 7 fathoms in good ground, but the anchorage is not reckoned very good until we arrive above St. Jean church. All along the edge of the South bank, from opposite the Pillars to Crane island, the holding ground is a stiff clay, and so good that it is sometimes difficult to weigh an anchor. Off Crane island, half a mile or more about the Beaujeu bank in 6 or 7 fathoms at low water, there is excellent anchorage in westerly winds; and under the west end of the island, in 5 fathoms, there is equally good anchorage with the winds from eastward. Vessels bound down, and meeting a strong easterly wind anywhere above the light-vessel, had better run back to this anchorage.

TIDES.—The flood begins much earlier in the North channel than in the South, and the first of the stream therefore comes from the northward, setting at first about S.S.W. upon the Shoals of St. Anne and St. Roque, but inclining gradually more to the westward, until at a quarter flood it sets fair to the S.W. between the *black* and *white* buoys of the South Traverse. After half-flood it sets S.W. by W., and towards the end of the tide still more to the westward; perhaps because, the time of high-water being somewhat earlier in the North channel, the water has begun to fall before the flood has quite ceased in the South.

The ebb-stream sets nearly in the contrary direction to the flood, as just stated; the first of the ebb setting off from the Shoals of St. Anne and St. Roque, through the channels to the westward of the Middle ground, and over the tail of the latter to the N.N.E.

Above the Pillars both tides set fairly up and down the river.

In the Narrows of the South Traverse the rate of the ebb is from 6 to 7 knots, and that of the flood from 5 to 6 knots. The rates of the flood and ebb tides decrease gradually as we proceed to the westward until off the Pillars; they are 3½ and 3 knots respectively, a rate which they retain as far up as Crane island.

SOUTH CHANNEL, ABOVE CRANE ISLAND.

SOUTH SHORE, FROM ST. THOMAS TO LEVI POINT.

St. Thomas point is low, and lies 3 miles W. ¼ N. from the entrance of the River Sud, and the church and village of St. Thomas on its west bank.*

WYE ROCKS, lying North three-quarters of a mile from St. Thomas point, are separated from the western part of the Bank of St. Thomas by a channel nearly a quarter of a mile wide and with 4 fathoms water in it. They form a narrow ridge 4 cables long in a S.W. direction, and have 4 feet least water at their western end.

The marks for these rocks, which are out of the way of vessels with a fair wind, are the Seminaire, on the north shore, in line with the east point of Reaux island; and Crow island just open to the westward of Middle island. Belle Chasse island and St. Vallier point touching, leads about 2 cables to the northward of the rocks, and also along the northern edge of the Bank of St. Thomas, in 4 fathoms.

TROU de BERTHIER.—Berthier church and village are 5¾ miles to the W. by S. ½ S. from St. Thomas point. The intermediate shore is rocky and rather low, with shoal water extending off it a third of a mile.

The Trou de Berthier. a tide harbour for the river craft, and dry at low-water, is close to the eastward of the church. A landing-pier has recently been erected here, having a depth of 15 feet at its extreme end at the lowest tides.

BELLE CHASSE ISLAND, of high, steep, and bare greywackè rocks, is 3 cables long, parallel to the shore, from which it is distant more than half a mile. The west point of the island bears W. by N. a mile from Berthier church, and not more than 2¼ fathoms water can be carried through between the island and the main. North from the centre of the island, and at the distance of a long cable, lies a small Pointed rock, nearly dry at low-water, and with from 4 to 6 fathoms between it and the island. Within the island to the S.W. is a shallow bay, and the small river Belle Chasse.

ST. VALLIER POINT, 2⅓ miles W. ½ S. from Berthier church, is remarkable as being higher than any other point below it on the south shore, above the Traverse. The church and village of St. Vallier stand low down on the shore of the shoal bay, between St. Michel and St. Val-

* *See* Plan: — River St. Lawrence, below Quebec, Sheet VI., No. 316; scale, *m* = 1 inch.

lier points; and 2 miles S.W. by W. from the extremity of the latter. A stone mill will be seen on the ridge in rear of the church, and the small river Boyer enters the bay 1½ miles to the westward of St. Vallier.

ST. MICHEL POINT is very low, and bears W. by S. 3½ miles from St. Vallier point. Reefs of slate, dry at low water, extend a considerable distance to the N.E. from both these points, but especially from the latter.

BANK of ST. VALLIER fills the whole bay between St. Vallier and St. Michel points, and extends nearly three-quarters of a mile to the N.E. from St. Michel point. The eastern leading marks for clearing this bank are, Berthier east point just open to the southward of Belle Chasse island, and the lead also gives sufficient warning. The western leading marks are, Beaumont church just open to the northward of Durantaye point, the west point of St. Michel bay.

The village and church of St. Michel stand on the shore of the bay, nearly 2 miles W. by S. from the point of the same name. At Durantaye point, a mile to the westward of the church, the shoal water extends only one cable's length off shore.

BEAUMONT SHOALS or reefs commence from Durantaye point, and extend more and more from the shore as the vessel proceeds to the westward, until opposite St. Lawrence point, on Orleans isle, their northern edge, in 3 fathoms, is nearly three-quarters of a mile off shore. Their extent out from the shore diminishes farther to the westward, and they may be considered to cease about a mile to the westward of Roys mills, the shoal water there reaching only 260 yards from the shore. These shoals are rocky, and dry in part at low water; and their northern edge is steep, with deep water close to it. The warning by the lead is insufficient in a vessel going fast, and therefore these shoals should be approached with great caution. The mark for their northern edge, in 3 fathoms, as far westward as Beaumont mill, is Durantaye and St. Michel points in one, bearing E. by N. And to the westward of Beaumont mills the mark is, St. Joseph church, Levi point, in one with Martiniere point; these last marks clear the western part of the shoals, as will be seen on the chart. A *black* buoy is moored near the north-east extremity of these shoals in 4 fathoms water, with St. Lawrence church bearing North, and the church on Levi point just open to the northward of Martiniere point.

Beaumont church and Beaumont mill are situated 5 miles W.S.W. of St. Michel. The church stands on the high and steep banks of the river, which extend several miles on either side of it, and the mills low down at the foot of the bank. Roys mill, where there is a waterfall, also stands

low down, near the water's edge, and a mile to the westward of Beaumont mill.

LEVI POINT. — St. Joseph church, on Levi point, bears W. by N., and is distant 6½ miles from Beaumont church, and the shoal water nowhere extends above a quarter of a mile from the shore between Levi point and Roys mill.

LEVI REEF extends 360 yards off shore to the northward, and should not be approached nearer than 10 fathoms water from between the north and west, or 7 fathoms from between the north and east. On the north-west extreme of this reef, St. Joseph church is in one with the eastern side of a small rocky mound near the water's edge, bearing about S.E. by S., and Pavilion and St. Pierre points, on the north-west side of Orleans isle, are in one.

SOUTH CHANNEL, ABOVE CRANE ISLAND.

ISLANDS AND SHOALS FORMING ITS NORTHERN SIDE.

The islands in order westward of Crane island are, Haystack, Mill, Race, Middle, Margaret, Cliff, and Grosse islands. There are several others farther to the northward, but they are in the Middle Traverse. All these islands are of greywacke rock, more or less steep, partially wooded, and the highest not exceeding 200 feet above the sea.*

Between these islands there are narrow and intricate passes, leading into the Middle Traverse, and with water enough for vessels of the largest draught; but as they are of little or no use for the common purposes of navigation, we shall not swell these remarks by attempting a particular written description, which must of necessity fail of affording the same degree of useful information as that given in the Admiralty charts.

To the westward of Grosse isle are, Reaux and Madame islands, of slate rock, low, wooded, and connected by reefs of slate nearly dry at low water. The south-west point of Madame island is nearly 11 miles W. by S. from Crane island, and opposite Belle Chasse island, from which it is distant 2¼ miles. Extending from almost all these islands there are reefs of slate rock, thinly covered with sand and mud, and bounding the South channel on its northern side for nearly 14 miles to the westward of Crane island.

CRANE ISLAND SPIT is the first of these reefs extending 1¾ miles W. by S. from Crane island, and with 9 feet least water. There are no leading marks for the southern side of this spit, and therefore a vessel

* *See* Charts:—River St. Lawrence, Sheet VI., No. 316; scale, m = 1 inch: and enlarged plan of the North and Middle Traverses, with views, No. 318; scale, m = 2 inches.

standing towards it should take care not to bring the south side of Crane island to bear so far to the eastward as E. by N., and to tack at the first cast of the lead showing less than 5 fathoms at low water. A *red* buoy is moored in 3 fathoms on the west end of this spit, with Middle and Crow islands in one; and two sugar loaf beacons on the south point of Crane island in one.

The channel between Crane Island spit and Margaret island into the Middle Traverse is half a mile wide, and has more than 12 fathoms water in it. The ebb tide sets strongly to the north-east, through this channel, and between the islands into the Middle Traverse; thus causing a powerful indraught, which should be guarded against in beating down the river, especially in light winds, and with a heavy or slow working vessel.

MARGARETS TAIL, extending a mile to the S.W. from Margaret and Cliff islands which are nearly joined at low water, is a dangerous shoal, the slate being awash in some parts of it in low tides. From its southern edge in 4 fathoms the south side of Haystack island and Crane island church are in one, bearing E.N.E. A *red* buoy is moored in 2½ fathoms on its western end, with the south side of Margaret island bearing N.E. by E.

GROSSE PATCH is a narrow rocky shoal, 6 cables long in a south-west direction, and with 7 feet least water: it lies to the west of Margarets Tail, and the channel between them is a quarter of a mile wide and carries a depth of 5 fathoms. A *white* buoy in 2½ fathoms marks the east end of the patch; from it the north side of Margaret island bears N.E. by E. ½ E.

There is also a channel with 3½ fathoms in it to the westward of Grosse patch, between it and Grosse Island Tail, and which, if a buoy were placed on the west end of the patch, might occasionally be conveniently used in westerly winds. Both these channels lead to the anchorage off the Quarantine establishment on the southern side of Grosse island.

QUARANTINE ANCHORAGE. — Vessels generally lie between the Grosse patch and island, to be near the establishment; but the anchorage farther eastward in the Quarantine passage to the northward of Margaret island is by far preferable. All merchant vessels, as the law now stands, are obliged to anchor off Grosse island, from whence, after examination, they are allowed to proceed to Quebec, if not detained at the Quarantine anchorage. These vessels in the first instance generally anchor outside Grosse patch, and to the westward of Margarets Tail, choosing their berth in 5 fathoms, where there is one of the best roadsteads for riding out an easterly gale in the river.

For the guidance of the numerous vessels which stop there, a *red* buoy has been placed on the south-west end of Margarets Tail, as mentioned above, and a *white* buoy on the north-east end of Grosse patch; but in the absence of the buoys, the east points of Grosse island and the Brothers in one, bearing N. by E., will lead through the channel between them; whence a vessel may either haul to the eastward between Grosse and Cliff islands, or to the westward between Grosse patch and Grosse island, as may be preferred. In the latter case care must be taken to avoid a small rock with 7 feet least water, on the north side of which a *chequered* buoy has been placed. This rock lies about 560 yards N.W. by W. from the *white* buoy at the north-east end of Grosse patch; and about 360 yards off the shore of Grosse island at high water. The inner anchorage at Grosse island is not otherwise useful than as a place for vessels to ride quarantine: but the anchorage outside the Grosse patch is a convenient place for which vessels, on the approach of a strong easterly wind, may bear up, when there is not tide enough for them to reach the anchorage under Crane island, 4 miles farther to the eastward.

GROSSE ISLAND TAIL consists of sand, and extends nearly $1\frac{1}{4}$ miles S.W. from Grosse island. The passage between this shoal and the eastern part of the Banks of Madame is less than 2 cables wide, and has $3\frac{1}{2}$ fathoms water in it; it leads (after passing between Reaux and Grosse islands) into the Middle Traverse. The leading mark for the entrance of this passage is two-thirds of Patience island open to the northward of Grosse island; and the cross mark for it, and also for clearing the south-west end of Grosse Island Tail is, St. Français church (on the isle of Orleans), in one with the south-west point of Reaux island.*

BANKS of MADAME, in their eastern part, extend $1\frac{3}{4}$ miles to the southward of Reaux island; and from their south-east extreme, in $2\frac{1}{2}$ fathoms, the south side of Two Heads island is just open to the southward of Grosse island.† The mark for clearing the southern side of these banks, as well as Grosse Island Tail and Grosse patch is, Race island kept just open to the southward of Margaret island.

These banks extend three-quarters of a mile to the southward, and also $2\frac{1}{2}$ miles to the south-west of Madame island. This western end of the banks has a large space of slate rock, dry at low water, near its south-west extreme, and is commonly called Madame reef. From its south-west extreme the north side of Reaux island is just open to the northward of Madame island, bearing N.E. $\frac{3}{4}$ E., and St. Vallier church S. $\frac{1}{4}$ E.; Berthier church, and the west end of Belle Chasse

* *See* views F. and E. on the enlarged plan of the North and Middle Traverses.
† *See* view C. on the same plan.

island in one, lead to the south-west of it. The *red* buoy, which has been lately placed on the west end of this reef, lies in 5½ fathoms, with St. Vallier church bearing S. ¼ E., and a house on the west end of Reaux island, just open to the northward of Madame island.*

ISLE of ORLEANS is of greywackè and slate rocks, dipping generally at a high angle to the south-east. It is 18 miles long, with an extreme breadth of 4⅜ miles. This beautiful and fertile island forms a county, is divided into 5 parishes, has a good road all round it, and rises gradually from generally steep banks, to the central elevation of 350 or 400 feet above the water. The southern shore of the island forms the northern side of the South channel, from opposite Madame reef to within 3 miles of Quebec, a distance of nearly 14 miles. The church of St. John stands low and close to the water, on Orleans point, 2 miles west from the Madame reef, and 1¾ miles from St. Michel point, on the opposite south shore. At the distance of 2 and 3 miles respectively, above St. John, are the small rivers Lafleur and Macheux, off which there is good anchorage in 7 or 8 fathoms; and in their mouths small schooners and boats find shelter, but lie aground at low water.

St. Lawrence church also stands low, and close to the water, near St. Lawrence point, and 6 miles W.S.W. of St. John. Around both these churches there are villages; and along the shore between them, as well as on the bank above, the houses are numerous.

The slate rocks dry out to a considerable distance all along this part of the island, but the shallow water in no part extends beyond a quarter of a mile from the shore.

Patrick Hole is a small shallow bay 1½ miles to the westward of St. Lawrence church. A small brook enters the head of the bay; and off it, in from 6 to 9 fathoms, there is good anchorage, well sheltered from easterly winds. Here vessels bound down the river frequently anchor for a short time previous to their final departure for sea. On the high ground, about half a mile to the westward of Patrick Hole, stands the Telegraph No. 2. During the last war the telegraph stations formed a complete chain of communication as low as Green island, but at the time of this survey they had been discontinued and taken down, with the exception of No. 2. They have since been re-established as far down as Grosse island for the purpose of communicating with the Quarantine establishment.

ANCHORAGE.—The west end of Orleans isle is about 4¼ miles W. by N. from Patrick Hole; there is a wharf and a group of houses upon it, and

* *See* Chart of River St. Lawrence, below Quebec, sheet 7, No. 317; scale, *m* = 1 inch.

it is quite bold. In the bay, a mile to the eastward of it, lie the Marand rocks, always covered; but they are out of the fairway, and within the 3-fathom line, which there extends a quarter of a mile from the shore at high water.

Under the west end of Orleans, in from 8 to 15 fathoms, there is a good place for a vessel arriving with an easterly wind to anchor, which she ought to do, and wait for daylight rather than risk running among the crowd of shipping off Quebec in a dark night and rapid tide-way.

BASIN and HARBOUR of QUEBEC.—The port of Quebec extends from Barnaby island to the first Rapid above Montreal; and a book containing the bye-laws and harbour regulations of the Trinity Board is delivered to each vessel on her arrival by the harbour-master. The pilots are obliged to give all due information respecting quarantine to the commanders of vessels when they first come on board. The Basin and Harbour of Quebec are shown on so ample a scale in the Admiralty plan, that a lengthened written description becomes unnecessary.*

QUEBEC BASIN is 3 miles long from the west end of Orleans to the India wharf at Quebec, and about $1\frac{3}{4}$ miles wide from Levi point across to the shore of Beauport. Off the Beauport shore a bank of slate, thinly covered with mud, and great part of which is dry at low water, extends more than a mile from the shore. The Observation bastion, in one with the Mortella tower in the suburb of St. John, marks the southern edge of this bank, from abreast the west end of Orleans to within half a mile of the India wharf; but a stranger would not easily make out the bastion, which ought to be distinguished by a white mark. The breadth of the channel between this bank and the shoal off Levi point is 6 cables, and the depth of water nearly 30 fathoms. The water is so deep in the basin that there is no good anchorage, excepting under Orleans, and off the mouth of the river St. Charles.

It is difficult to imagine anything more strikingly beautiful than the view which suddenly bursts upon a stranger ascending the St. Lawrence and entering Quebec Basin, as the vessel opens out the falls of Montmorency on the one hand, and the city of Quebec on the other.

QUEBEC HARBOUR may be considered as extending from off the river St. Charles up to the Chaudière river, a distance of 5 or 6 miles, which all through the navigable season is thickly occupied by vessels employed in the timber trade, for the most part lying alongside the numerous wharves and blocks for embarking lumber, and consequently out of the stream.

But sometimes the spring or fall fleet arrives to the amount of several

* *See* Plan of the Harbour and Basin of Quebec, No. 319; scale, $m = 3$ inches.

hundred sail together; and then, before they have had time to take their places for loading, the river is so crowded with shipping, that it is difficult to find a clear berth. A gale of wind, occurring under such circumstances, is sure to do damage, since the water is deep, the ground (sand and gravel) not good, the tide strong, and the vessels often carelessly anchored.

A great annoyance to vessels at anchor off Quebec, are the large and heavy rafts of timber so frequently dropping down with the strong ebb-tide. These often get athwart hawse of vessels, and are almost certain to do them injury, either by forcing them from their anchorage or otherwise.

In 1856, 990 vessels, amounting to 462,083 tons, entered inwards, and 1,068 vessels, of 495,867 tons, cleared outwards; and the value of imports was 871,598*l.*, and of exports 2,048,299. At Montreal, at the same date, 217 vessels, of 65,491 tons, entered inwards, and 187 vessels, of 56,648 tons, cleared outwards; and the value of imports was 4,066,352*l.*, of exports 956,392*l.*

The average number of vessels arriving annually at Quebec during the last five or six years has been 1,445 sail, of which 230 were Montreal ships. The average number of vessels cleared outwards during the same time was 1,497 sail, of which 235 were Montreal ships.

DOCKS.—For the repairs of vessels, there are at present (1860) in the harbour of Quebec four floating docks, and five gridirons. The docks are capable of receiving vessels of from 1,000 to 1,200 tons, and one of them will admit a vessel of 225 feet keel, whatever may be her tonnage. One of the gridirons will receive ships of 1,800 tons. There is also a patent slip at Levi point, opposite the city.

ANCHORAGE.—The breadth of the St. Lawrence at Quebec is very little more than half a mile, but it expands, immediately above the city, to 1¼ miles. The depth is 28 fathoms at low water abreast the city, and 20 fathoms in the wide part above; the deepest water being over towards the Levi point shore. The best anchorage is on the Quebec side, in from 11 to 17 fathoms; there being nothing in the way excepting an old wreck, with 9 fathoms water over it, but by hooking which many anchors have been lost. The position of this wreck is shown by a rippling during the ebb tide, and also in the plan of the harbour. Above the city, from off Diamond harbour, all along the Lamouche bank nearly to Pizeau point, the anchorage is much better than off it, the depth of water being much less and the ground good. The mark for clearing the outer or southern side of the Lamouche bank along its whole extent is, the north-west sides of Levi and Orleans points in one.

A narrow channel with from 3 to 4 fathoms at low water com-

mences just to the westward of Diamond harbour, and runs up within the Lamouche bank to some distance above Wolf cove. In this is the most secure anchorage at Quebec, and the only place, if any, where a vessel could safely winter afloat. We are, however, not aware that the experiment has ever been made of wintering a vessel of large draught of water afloat anywhere about Quebec, although it has been successfully tried in the above anchorage, in the case of steamers drawing so little water that they could be hauled within the blocks or isolated wharves.

The small craft belonging to Quebec winter in the Cul de Sac, and in the mouth of the river St. Charles, being hauled aground for the purpose. In the former of these places two or three vessels of the size of a sloop of war might be secured from the ice, which closes the navigation of the St. Lawrence from about the 25th November to the 1st of May. Sometimes, although rarely, the navigation closes by the middle of November, and remains closed to the 8th or 10th of May; at others it would be possible to navigate it till near Christmas, and ships have arrived in the middle of April; but these are extraordinary seasons, and the period first named is that during which the navigation usually remains closed. The river seldom or never freezes across below Quebec, and only occasionally opposite the city; but it is full of heavy ice, moving up and down with the tides with irresistible force. There is generally, but not always, a bridge of packed ice formed 5 or 6 miles above Quebec; and higher up, as far as Lake Ontario, the St. Lawrence is everywhere frozen across, excepting in places where the current is very strong.

DIRECTIONS from CRANE ISLAND to QUEBEC.—There is so little difficulty in the navigation from Crane island to Quebec that scarcely any farther direction will be requisite beyond that which may be gathered from the foregoing description and remarks, read with reference to the Admiralty charts, which they are intended to accompany and explain.

The course and distance from the west end of Crane island to St. Lawrence point is, W. by S. $\frac{1}{4}$ S. 21 miles; from off St. Lawrence point to Levi point, W. $\frac{1}{4}$ N. $7\frac{1}{2}$ miles; and from the latter to Quebec, S.W. about 2 miles.

With a fair wind vessels run up at night without hesitation, unless it be too dark to see the land, and even beat up in fine weather. With a fair wind in the day-time, and with the assistance of the charts and these directions, any seaman of common intelligence might take a large ship up through this part of the river, especially now that buoys have been placed on all the principal dangers.

From mid-channel between the west end of Crane island and the Bank of St. Thomas, to midway between St. Michel point and St. John church

in the isle of Orleans, the course is W. by S. ½ S., and the distance 15 miles. In this interval the channel is clear, direct, and from 1½ to 2 miles wide; so that, even at night, with the land in sight, and the lead going, there cannot be any difficulty. As soon as it is ascertained beyond doubt that the vessel is above the *red* buoy on the west end of Madame reef, haul gradually over towards the Orleans side, sufficiently to avoid the Bank of St. Vallier, and the reef off St. Michel point, and then steer for St. Lawrence point and keep it aboard to avoid the Beaumont reefs. Under the circumstances which we are supposing, of a night not too dark to distinguish objects, St. Lawrence church will be seen, off which, and all round the point to the eastward, the shoal water extends to the distance of nearly 2 cables from the high water mark, the edge of the shoal being very bold. Give the point a berth of a third of a mile, or do not go nearer than the depth of 10 fathoms. If the *black* buoy on the Beaumont reefs can be seen, all difficulty will be removed, since the channel to the northward of it is clear, and more than half a mile wide.

The shore of Orleans should be kept aboard after passing St. Lawrence point. If it be blowing fresh from the eastward, it will be advisable to bring up off Patrick Hole till daylight, or under the west end of Orleans, rather than risk running among the crowd of shipping in the night. In running up in the night, a good look out should always be kept for vessels, of which there are often many bound down and lying at anchor in various parts of the river, but especially under Crane island and off Patrick Hole. When St. Joseph church on Levi point bears about S.E. by S., it will be in line with the eastern side of the Mound or small hillock at the water's edge; the vessel will be then off the north-west extreme of the Levi reef. To the westward of the reef the Levi point shore becomes quite bold. Go no nearer to that reef or to the Beauport shoals than the depth of 10 fathoms, and that with caution, for they are very steep.

With beating winds, the leading marks which have been given for the shoals on either side, and which will also be seen in the plans, together with the buoys and soundings, will show when to tack. In passing between St. Lawrence point and the Beaumont reefs, which is the narrowest part of the channel, and only 6 cables wide, some caution will be necessary; attend to the leading marks and the *black* buoy on the northern edge of the reefs, and go no nearer to them than the depth of 10 fathoms.

ANCHORAGE.—Besides the best places for riding with easterly winds, there is anchorage almost everywhere between Crane island and Quebec. The best ground for holding is generally on the northern side of the channel; and one of the best places in strong westerly winds is under St. John point, Orleans isle.

TIDES.—At Quebec it is high water, full and change, at 6h. 38m., and ordinary springs when unaffected by winds, rise 17 or 18 feet; and neaps 13 feet. The highest tide ever observed, during a strong north-east gale, rose 21 feet above the ordinary low water mark in spring tides. The greatest difference of level observed, from the lowest fall to the highest rise, was 24 feet. The lowest neap tide observed rose only 10 feet from the preceding low water mark; that is, about 12 feet above the low water mark in ordinary spring tides. In the spring, at the melting of the accumulated snow of winter, when the river is generally full of water and easterly winds prevail, the tides do not fall so low by 2 or 3 feet as at other times; or rather there are 2 or 3 feet more of water in the river when the tide is out. On the contrary in the dry season, as in August, when the supply of water from the rivers and lakes is much diminished, and westerly winds prevail, the river is much lower than at other times. The low water mark is then at a lower level by about 2 feet, and on rare occasions even 3 feet, below the low water mark in ordinary spring tides.

It is generally thought at Quebec that the morning spring tides rise higher than the evening tides, by about 3 feet, in the month of May; and that in the month of October the contrary takes place; and the observations that were made during the Admiralty survey would seem to establish the truth of the popular belief, for it was found correct in the spring tides which follow the full as well as the change of the moon, and whether the moon had north or south declination. But it would require better and longer continued observations than were obtained, to speak positively respecting this "diurnal inequality" of the tides in the St. Lawrence; therefore until additional observations shall enable us to speak with certainty, the above is left as a general remark of considerable practical importance when a vessel has to be hove off a shoal, to be launched, or to pass over any shallow part of the river. For this much is certain, that in every part of the river and gulf visited during the survey, there was a considerable difference in the rise and fall of the spring tides of the same day, unless it may be when the moon is on the equator, when it is believed to disappear, as it ought to do if the varying declination of the moon be its cause.

The tides are regular and not strong below the Beaumont reefs, seldom exceeding the rate of 2½ knots; but in the narrow channel and deep water (nearly 20 fathoms) between these shoals and Orleans, the rate of the ebb sometimes amounts to 4 knots; above the shoals the rate of the tide is from 2½ to 3 knots, increasing again as we enter the basin of Quebec. Ships, therefore, running up with the flood, and before a strong easterly wind, should be careful to shorten sail in time, and to give the

reef off Levi point a good berth, as they haul gradually round it through the Basin, and to the south-west towards Quebec.

Between Quebec and Levi point, in strong spring tides, assisted by a strong wind, the flood will run at the rate of nearly 4½ knots per hour; and the ebb, in the spring, just after the melting of the winter snow, 5 knots; but, under common circumstances, 3½ and 4 knots respectively are the usual rates of the tides. A good range of cable should always be ready, for it is not easy at times to bring a vessel up off Quebec, especially in the deep water and loose ground in the centre of the channel.

NORTH CHANNEL, NORTH TRAVERSE, AND ORLEANS CHANNEL.

It does not appear to be requisite or useful to enter into any farther account of the Middle channel beyond the general and comparative view of it given in page 267, where it is stated that it is too intricate and difficult for general navigation, but that nevertheless it would be possible to take even a vessel of the largest draught through it, choosing of course the proper time of tide, and placing buoys where requisite. It is, however, not easy to imagine the circumstances which could render it necessary to use this channel; but should such a contingency ever occur, the Admiralty plans would be of more use than many pages of written directions.*

The **NORTH CHANNEL** does, however, require some farther notice, for although it cannot be generally used without buoys, and a light at night, of which it does not seem necessary to incur the expense while the South channel answers as well or better for the general purposes of navigation, yet there may easily occur cases, as, for instance, when the South channel is obstructed by ice, in which it may be of importance to have more precise information respecting so fine a channel than will be found in the general and comparative description of it in page 268.

The entrance to the North channel, between the reef which extends a mile to the E.N.E. from the north-east end of Coudres island, and the shoals which stretch across Eboulemens bay, is 1½ miles wide, and has nearly 30 fathoms water in it. The narrowest part of the channel between Coudres and the main is 8½ cables wide, between Prairie shoal off the west point of Prairie bay and the opposite side near Cape Corbeau. The leading mark for this part of the passage, as well as for clearing the shoal on the west side of Cape St. Joseph, on the mainland side, is Cape Martin and Goose cape in one. There is a large settlement at Eboulemens, both

* *See* Plan :—River St. Lawrence, below Quebec, Sheet V., No. 315; scale, m = 1 inch: also, enlarged plan of North and Middle Traverses, No. 318; scale, m = 2 inches.

on the high grounds around the church of Notre Dame and also on the shores of the bay. Small craft lie aground on the mud in this bay within the large boulders on the edge of the shoals.

St. PAULS BAY, between Cape Corbeau and Cape Labaie, is nearly abreast the west end of Coudres, and is shoal and dry at low water, excepting a very narrow shallow channel into the river du Goufre, the entrance of which forms a secure tide-harbour for small schooners. There is a church, bridge, and village a mile up the river. Off Cape Corbeau, at half ebb, the spring tides run at the rate of 7 knots, causing a great and whirling ripple dangerous to boats in bad weather.

PETITE RIVIERE.—The church and settlement of Petite Rivière is situated 7 miles to the south-west of St. Pauls bay, on a narrow strip of low alluvial land at the foot of the granitic hills. The low land is fast diminishing by the action of the tides, obliging the people to cultivate the higher ground in their rear.*

LABAIE BANK.—Shoals of mud and large boulders extend three-quarters of a mile off Cape Labaie, and continue of equal extent off Petite Rivière. Their edge will be cleared by keeping the extreme western Capes, Rouge and Gribanne, open to the southward of Cape Maillard. The anchorage is good along the edge of the shoals off Petite Rivière, where, in 5 fathoms, clay bottom, vessels will be out of the strength of the tides, and well sheltered from westerly winds by Cape Maillard, which is 3 miles to the south-west of the church of Petite Rivière.

ABATTIS is a landing place 1¼ miles to the south-west of Cape Maillard; and at the Sault au Cochon, 2 miles farther to the south-west, the shoals, which line the shore all the way from St. Pauls bay cease. The large boulders on these shoals prevent landing or approach to the shore in boats until after half flood. There is only one landing-place between Abattis and Cape Tourmente, a distance of nearly 11 miles. This landing is at Gribanne, where a couple of boats may be hauled up. To the westward of the Sault au Cochon the mountainous and uninhabited coast is quite bold, the high and precipitous capes of various granitic rocks being washed by the river as far as Cape Tourmente, where the Seminaire bank commences, and the mountains trend to the north-west away from the shore.

COUDRES ISLAND, the largest island below Quebec, excepting Orleans, is 6 miles long, 2½ miles wide, and nowhere above 250 feet above the sea. It is composed of greywackè and slate rocks, is tolerably fertile, forms a parish by itself, and has a church standing low down near its south-west

* *See* Plan:—River St. Lawrence, below Quebec, Sheet VI., No. 316; scale, *m* = 1 inch.

extreme. It has as many inhabitants as it can support, having been settled at a very early period. The southern side of the island is lined with rocky shoals, which extend fully a mile out from the shore, as they do also off its north east point; but the north side of the island is bold for about 2 miles to the eastward of Prairie bay.

PRAIRIE BAY is on the north side of Coudres island, and near its centre; Cape Aigle, the east point of the bay, being 3 miles to the westward of the east end of the island. The bay is 1½ miles wide from Cape Aigle to Prairie point, is not deep, only slightly curved, and shows a sandy beach at high water. Off Prairie point its west extreme, Prairie shoal, the greater part of which is of mud and grass resting on slate, and only covered at high water, extends two thirds of a mile to the north-west from high-water mark, sheltering the bay from south-west winds. The line of Notre Dame church in one with the north-east end of the low clay cliff of St. Joseph point, passes a cable's length within the 3 fathoms north extreme of this shoal; but if the church be kept on with the north-west end of the same cliff, it will lead clear of the shoal in deep water. From the north point of the shoal—near which a *black* buoy is placed—St. Pierre church is in line with the east side of St. Pauls bay; the buoy lies in 3 fathoms with the church its own breadth open to the westward of the east point of the bay.

Goose cape shelters Prairie bay from easterly gales, and prevents any sea of consequence from rolling in, so that this anchorage is quite safe in all winds; the ground, of clay, being good for holding, and the tides easy if the vessel be not anchored too far out. There is room for many vessels, the space to anchor in being almost a mile long, and about a third of a mile wide, reckoning from 3 fathoms mark to 10 fathoms, beyond which the water deepens rapidly, and the tides are of great strength. The best berth is in 6 fathoms, near the centre of the bay, where the tides are not nearly so strong as at Quebec, and where the *Gulnare* rode out a gale from the eastward (so heavy as to do great damage to the shipping off that city) with ease and safety. Ships meeting with an easterly wind below the Traverse will find this a good anchorage to run for, and should proceed as follows:—

DIRECTIONS.—Being below the Middle Ground, stand over towards Eboulemens, going no nearer to the reef off the north-east end of Coudres island than the depth of 10 fathoms. Having passed the reef and opened out the channel, bear up along the shore of Coudres, passing close to Cape Aigle into the anchorage. Approaching this anchorage from the westward, bring the leading marks on for clearing the reef off Prairie point, viz., Notre Dame church on with or open to the northward of the north-west extreme of the clay cliff off St. Joseph point. Run upon

these marks until St. Pierre church is shut in behind the east side of St. Pauls bay, when the vessel may haul to the southward into the anchorage. The anchorage under Coudres in easterly winds is very good, the best riding being in 7 fathoms, with the south point of Coudres bearing between E. and E. by N.

TIDES.—In Prairie bay the flood-tide by the shore is longer than the ebb, the water flowing for 6h. 20m., and ebbing only 6h. 0m., which is contrary to the observations taken in every other part of the river. The stream of flood at the anchorage in 6 fathoms, is stronger than that of the ebb, and about 4 knots in spring tides. The stream of the ebb is turned off in great measure by the shoal of Prairie point. Its rate for the first two hours of the tide is about 2 knots. It then slacks for about five or six minutes so completely, that a vessel will swing to the wind. After this the stream becomes stronger and regular during the remainder of the tide, its rate being about 3½ knots in spring tides. Vessels should moor at Prairie, or at least have a kedge out to insure keeping a clear anchor.

COUDRES BANK.—The southern side of the north channel from Coudres island to Burnt Cape ledge is formed by Coudres bank, and by an unbroken line of shoals, the northern edge of which is of sand, and so nearly straight that it may easily be followed by the lead. The soundings approaching it are such as to give good warning, and vessels may anchor in fine weather all along that side in 6 or 7 fathoms, clay bottom, and out of the strength of the tides.

NEPTUNE ROCK lies nearly 15 miles to the south-west of Coudres island, and about 6 cables' lengths within, or to the southward of the edge of the shoals. It is always above water and easily recognised.

BURNT CAPE LEDGE is an extensive chain of greywackè and slate rocks, the south-western part of which is always above water. The south-west end of the ledge is S.W. 4½ miles to the south-west from the Neptune rock, and nearly abreast Cape Brulè on the north shore, from which it is distant 1½ miles.

BRULÉ BANKS are sands which dry in part soon after half-ebb, and lie to the westward of Burnt Cape ledge, to which they are joined by shoal water. The channel between these banks and the north shore is 6 cables wide, and has from 7 to 10 fathoms water in it. This is the only channel, but between the north-eastern part of the Brulè banks and Burnt Cape ledge there is a Cul de Sac in the banks, which must be avoided by keeping the north shore aboard, after arriving off the eastern part of the ledge. On the north-east point of the Brulè banks, in 3 fathoms, the west end of the Burnt Cape ledge is in one with the east

side of Heron island, bearing S.E. This was the case at the time of the Admiralty survey in 1828, but the shoal has since extended to the *black* buoy which is now moored in 3 fathoms, with the west end of Two-heads island, and the west end of Burnt Cape ledge in one, bearing S. ¾ E., and Cape Tourmente W.S.W.

EASTERN NARROWS.—The Eastern Narrows of the North Traverse, between the south-west extreme of the Brulè banks and the north-east extreme of the Traverse spit, lie S.W. by W. ½ W. 3½ miles from the west end of the Burnt Cape ledge, and South 1½ miles from Cape Tourmente. Great part of the Traverse spit, as well as the Brulè banks, dry soon after half-ebb, and thereby greatly lessen the difficulty of the passage. The Horse-shoe, and another sand lie to the north-west of the Traverse spit, the whole resting on an extensive reef of slate, running out from the north-east end of Orleans isle.

Four fathoms can be carried through the Eastern Narrows, but the passage is only a quarter of a mile wide from the depth of 3 fathoms to 3 fathoms: and as the leading marks can only be made out in fine weather, and by experienced eyes, it required buoying to render it safe for large vessels. The cross mark for the eastern entrance of this passage, and for the north-east extreme of the Traverse spit is, the south-west point of Two Heads island on with a distant blue hill, bearing S.E. by E.¾ E.;* the north-east end of Margaret island being at the same time just open to the westward of Two Heads island. On the last named mark a *red* buoy is moored in 3 fathoms; and on the north-east end of the Traverse spit and opposite to it, on the north-west side of Brulè bank, a *black* buoy is moored in the same depth of water, and with the east end of Margaret island and west end of Two Heads island touching, bearing S.E. by E. ½ E. The mark for leading between these buoys, and through the Eastern Narrows into the Traverse is, the south-west point of Reaux island and St. Vallièr point in one, bearing S.S.W. ¾ W.†

WESTERN NARROWS.—From the Eastern Narrows the channel runs S.W. by W. close along the southern edge of the Traverse spit, leaving all other shoals to the southward. At the distance of 2½ miles are the Western Narrows, which is also a quarter of a mile wide, carries 4½ fathoms water, and lies between the Traverse spit and the West sand, which is 1½ miles long, and carries 7 feet least water. On the east end of the West sand, where a *chequered black* and *white* buoy is moored in 3 fathoms, Berthier church is just shut in behind the south-west point of Reaux island, bearing S. ½ W.; and Patience island and Two Heads island

* *See* View A. on enlarged plan of the North and Middle Traverses, No. 318.

† *See* View B. on the same plan.

are touching, E. ¼ S.; and the mark for leading clear of this sand, at the distance of 2 cables to the north-east, is Reaux and Grosse islands touching S.E. by E. The west end of the same sand is cleared by the line of St. Joachim church and the east end of Orleans in one.

The leading mark to the westward, through the Western Narrows, after having arrived as far as the east end of the West Sand, are St. John and Dauphin points in one, bearing S.W. ¼ W. Having cleared the Western Narrows there is a fine clear passage between Orleans isle and the Banks of Madame, not less than two-thirds of a mile wide, and with good anchorage all the way to the South Channel at St. John point, a distance of nearly 7 miles. On the south side of Orleans, St. Français church will be seen, 1½ miles from the north east end of the island, and the river Dauphin, affording shelter to boats 2½ miles farther to the south-west.

DIRECTIONS for NORTH CHANNEL.—To sail up the North channel by attention to the leading marks given in page 292, there will be no difficulty in passing between Coudres island and the main, especially now that a *black* buoy has been placed on the north extreme of the Prairie shoal.* When St. Pierre church opens out to the westward of the eastern side of St. Pauls bay, a vessel will be up to the north extreme of the Prairie shoal, and when the small islet at the west end of Coudres opens out to the westward of Cape Branche, she will be past it, and may haul to the south-west up the channel. If wishing to keep the shore of Coudres aboard, give Cape Branche a berth of half a mile in passing, or go no nearer than 10 fathoms water, and that with due caution, for the bank will be found extremely steep-to until the vessel is abreast the west end of the island. After passing Coudres she may approach the edge of the bank to 7 fathoms, as far up as the Neptune rock. If, on the contrary, she wishes to keep the mainland aboard, remember to keep the extremes of the capes to the westward open to the southward of Cape Maillard, in order to clear the shoal off Cape Labaie, and also as far westward as Petite Rivière. Farther westward, as off Cape Maillard, where the shoal extends 6 cables off shore, she must be guided by the lead, going no nearer than 8 fathoms water, till she is past the Sault au Cochon, after which the shore becomes quite bold.

After passing Cape Gribanne, keep the north shore well aboard, as the vessel passes between the *black* buoy on the eastern end of Brulè bank and Cape Rouge, and until she arrives off Cape Brulè, or has brought

* *See* Plan :—River St. Lawrence, below Quebec, Sheet V., No. 315; scale, *m* = 1 inch.

the western end of Burnt Cape ledge to bear E.S.E.; when the buoys at the Eastern Narrows will bear S.W. by S., and be distant about 2½ miles. As soon as they can be distinctly seen bring the passage between them to bear S.W. by S., and the west end of Reaux island should then be seen between the buoys, and in one with St. Vallier point. Steer towards that mark if it can be made out, if not continue the S.W. by S. course, until the vessel has passed between the buoys, and advanced half a mile beyond them. The eastern points of Patience island and the Brothers will then be coming in one, and when they are so, and bearing S.E. by E. ½ E., the vessel will be through the Eastern Narrows, and must haul up S.W. by W. ½ W. for St. Français church on Orleans isle, running along the southern side of the Traverse spit, in not less than 4 fathoms at low water. When Reaux and Grosse islands are touching, and bearing S.E. by E., she will be close to the West sand, and should continue the same course, as she passes at the distance of a cable to the northward of the *chequered black* and *white* buoy on its east end, until St. John point (the south extreme of Orleans) comes in one with Dauphin point, bearing S.W. ¾ W. Then keep St. John point just in sight, as she runs through the Western Narrows, until St. Vallièr church opens out to the westward of Madame island, or if that cannot be made out, until St. Joachim church disappears behind the north-east end of Orleans, then haul more to the southward and she will be through the Narrows. The channel is then clear and wide the rest of the way to the South channel at St. John point.

Besides the Western Narrows there is an inferior channel, named West Sand passage, between the West and Centre sands, as wide as the Western Narrows, but it has only 3¼, or, at most, 3½ fathoms water in it. St. Vallièr point kept just shut in behind the north-east point of Madame island, bearing S.S.W., will lead through it, but for this, and another still narrower channel to the southward of the Centre sand, we must refer the mariner to the enlarged Admiralty Plan of the North Traverse.

To run through the North Traverse from the westward, enter the Western Narrows with St. Vallièr church open to the westward of Madame island, and steer from thence until St. John point becomes only just open to the southward of Dauphin point. Then steer N.E. ½ E., or so as to keep the last-named marks on, until the north-east point of Patience island comes on with the south-west point of Two Heads island, bearing E. ½ S. Then haul more to the eastward, so as to pass a cable's length to the northward of the *chequered buoy* on the eastern end of the West sand, and so as to run along the southern side of the Traverse Spit by the lead. In doing this the course will be about N.E by E. ½ E.,

and the Burnt Cape ledge will appear a little on the port bow. In coming down the mariner will of course have taken notice of St. Vallièr point, and will now be able to distinguish it. Bring it in one with the south-west point of Reaux island, and run through between the buoys at the Eastern Narrows with this leading mark on. If St. Vallièr point cannot be made out, keep the Traverse spit aboard until the cross mark* comes on, or until the vessel has passed between the buoys and deepened the water to more than 5 fathoms at low water, when she will be through the Narrows, and may haul over towards the north shore, and pursue a course down the channel.

The North Traverse is narrow and difficult, and a stranger would hardly at first sight be able to make out St. Vallièr point, or the islands used as the leading marks; neither could they be made out by any one in hazy weather. The pilots, however, to whom every object in the river is familiar, might easily make themselves acquainted with those marks, so as to be able to take a ship through, in clear weather, when required. Its navigation, however, is now facilitated for large ships, or for general use, by the two buoys at the Eastern Narrows, and one on the north-east extreme of the West sand.

The TIDES set fairly through the North Traverse, seldom exceeding the rate of 3½ or at the utmost 4 knots at the springs. The accession of the stream from the northward of Orleans, and the comparative narrowness of the channel, increases the rate to from 4 to 5 knots off Cape Brulè, below which it decreases until we arrive below Cape Maillard. Below Petite Rivière, the ebb, receiving a great accession from the Middle channel, especially during the first quarter of the tide, runs with great rapidity; the usual rate being 6 knots in the springs. In extraordinary high tides, assisted by winds, the ebb has been known to run full 7 knots, and the flood 6 knots, between Coudres and the main; which rate is as strong as between the buoys of the South Traverse. In gales of wind opposed to those rapid tides, there is a high, boiling, and breaking sea, exceedingly dangerous to boats.

ORLEANS CHANNEL, between the isle of Orleans and the north shore, being in several places not above a cable wide, is too narrow and intricate for written directions to be of any use, especially as there are no leading marks. With a fair wind, and the assistance of buoys, 4 fathoms water could be carried through this channel, which lies between shoals of mud and slate extending to a great distance from the shore on

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* *See* View A. on enlarged plan of North and Middle Traverses, No. 318.

either side, and nearly all dry at low water. The greater part of the shoals are visible for an hour or two on either side of low water, and the water is always rougher in the stream than on the shoals, especially during the weather tide; these circumstances enable the river craft occasionally to use this channel, and steamers of light draught of water have also several times passed through it. The shoals cause the landing for boats to be extremely bad excepting at high water, and the only good tide harbour in the channel for the river craft and for boats is the river St. Anne, 6 or 7 miles westward of Cape Tourmente.*

The Seminaire, which has been mentioned as one of the leading marks for the Wye rock in the South channel, is a large building with a tinned cupola and cross, standing on a rising ground not far from the water, and 3 miles westward of Cape Tourmente. The church and village of St. Joachim, one of the leading marks for the West sand, is 1¼ miles to the westward of the Seminaire. The other churches and villages on the north shore, in order westward, and from 4 to 5 miles apart, are St. Anne, Chateau Richet, and Ange Gardien, the last being 2⅔ miles from the Falls of Montmorency.

On the Orleans side the church and village of St. Famille stand near the shore, 7 or 8 miles from the north-east end of the island; and St. Pierre about a mile inland, and nearly opposite Ange Gardien.

TIDES.—The following table has been formed from the mean of the observations of several spring tides. The neap tides rise and fall nearly at the same rate as in ordinary spring tides; so nearly that any difference that there may be is far exceeded by the action of strong winds. But, as in neap tides, the whole rise and fall is not so great as in the ordinary springs shown in the following table, therefore the proportionate part of the rise and fall for every hour after low and high water will also be less, and an allowance must be made accordingly.†

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* *See* Plan:—River St. Lawrence below Quebec, sheet VII., No. 317; scale, $\frac{m}{n}$ = 1 inch.

† The rise in spring and neap tides is given in the Admiralty plans.

TABLE showing the HEIGHT of the TIDE at every HOUR after LOW and HIGH WATER in ordinary SPRING TIDES.

Place.	Hours after Low Water	Flood Tide. Height in Feet and Inches.	Hours after High Water.	Ebb Tide. Height in Feet and Inches.	Remarks.
	h. m.	ft. in.	h. m.	ft. in.	
Quebec.	0 0	0 0 L.W.	0 0	17 6 H.W.	The tides of Grosse island were observed to rise and fall nearly in the same manner, excepting that the rise after low water was not quite so rapid.
	1 0	5 6	1 0	15 0	
	2 0	10 6	2 0	11 4	
	3 0	14 9	3 0	8 0	
	4 0	16 3	4 0	5 10	
	4 45	17 6 H.W.	5 0	3 4	
			6 0	1 6	
			7 0	0 2	
			7 35	0 0 L.W.	
St. Roque.	0 0	0 0 L.W.	0 0	17 0 H.W.	
	1 0	2 6	1 0	14 9	
	2 0	5 3	2 0	11 9	
	3 0	9 6	3 0	8 6	
	4 0	13 6	4 0	5 6	
	5 0	16 3	5 0	3 0	
	5 35	17 0 H.W.	6 0	1 6	
			6 50	0 0 L.W.	
The Brandy Pots.	0 0	0 0 L.W.	0 0	17 0	
	1 0	1 3	1 0	15 0	
	2 0	4 7	2 0	12 0	
	3 0	9 5	3 0	8 6	
	4 0	13 8	4 0	5 6	
	5 0	16 0	5 0	3 0	
	5 50	17 0 H.W.	6 0	1 0	
			6 34	0 0 L.W.	
Tadousac. Entrance of the Saguenay river.	0 0	0 0 L.W.	0 0	17 0 H.W.	
	1 0	1 3	1 0	15 0	
	2 0	4 6	2 0	12 0	
	3 0	8 0	3 0	8 0	
	4 0	12 0	4 0	4 0	
	5 0	15 6	5 0	1 0	
	6 8	17 0 H.W.	6 16	0 0	

The use of the table will appear evident from a consideration of what has been said in page 264, but to render it still plainer we will suppose a case. A ship bound up the river, and drawing 23 feet water, weighs from off the St. Anne buoy just as the stream of flood begins to make; and it is judged from an estimation of her rate of sailing, in addition to that of the stream of flood, that she will be up to the Channel patch in 1¼ hours, and at the Beaujeu bank in 3 hours. Will she have water enough to pass over the Channel patch, and afterwards to the southward of the Beaujeu bank, and how much at each place? Now the stream of ebb at St. Roque runs down 1¼ hours after low water by the shore, but it is not low water until about a quarter of an hour later at the Pillars.

The flood had therefore been rising about one hour there when the ship weighed. The tide will therefore have been rising 2½ hours when she arrives at the Channel patch, which may be considered the same as the Pillars. Referring to the foregoing table, it will be found that the rise from low water answering to 2½ hours is about 1 fathom, which being added to 3 fathoms, the depth (shown on the plan) over the Channel patch at low water, gives 4 fathoms as the depth over it at the time when the ship is expected to pass, which is only one foot to spare.

Again, it is not low water at Crane island, near the Beaujeu bank, until 40m.,—say three-quarters of an hour, later than at St. Roque; the tide had therefore only risen half an hour at the Beaujeu bank when the ship weighed; which being added to 3 hours, the time she expects to be going there, will give 3½ hours flood at the time of her arrival. Now, for 3½ hours after low water the table gives about 2 fathoms rise, there will therefore be 5 fathoms to the southward of the Beaujeu bank at 3½ hours flood in ordinary spring tides, to which the table is adapted, and consequently water enough for the largest ships.

CHAPTER XII.

RIVER ST. LAWRENCE,—THE RIVER SAGUENAY; AND THE ST. LAWRENCE ABOVE QUEBEC.

Variation, in Saguenay River 19° West; and Quebec o Montreal, 16° to 10° West, in 1860.

The RIVER SAGUENAY was but imperfectly known, in a nautical point of view, before the Admiralty survey of it in 1829.* In the preceding year, 1828, Commissioners had been appointed to explore it by the Colonial Government, and one of the results was to dissipate all those extravagant exaggerations respecting the rapidity of its currents, its whirlpools, and its unfathomable depths, which had found their way into the few publications where any account of this river could be found. There was, however, little need of exaggeration, for the Saguenay really is a very remarkable and extraordinary river, if that indeed can with strict propriety be called a river which more nearly resembles a long and narrow mountain loch for the first 50 miles up from its confluence with the St. Lawrence.

In this distance the Saguenay is from two-thirds of a mile to 2 miles wide, filling up a deep transverse valley through mountains of sienitic granite and gneiss. These mountains rise everywhere more or less abruptly from the water, forming, in some parts, precipitous headlands more than 1,000 feet in height, and these, when seen one beyond the other up magnificent reaches of many miles in length, give rise to scenery which, although wild and barren, is yet full of grandeur and beauty. The granitic hills are in general quite barren, but the valleys, through which the rapid tributary streams descend, are filled with a deep deposit of sand and clay, and are thickly wooded. At Ah-ah bay and at Chicoutimi there are considerable tracts of good land, as there are also around Lake St. John; so that it seems probable that this country will be settled at no very distant day, especially as the Lumberers have recently begun to turn their attention in that direction. In 1829 the only permanent inhabitants were the residents at the Hudson Bay Company's trading posts at Tadousac and Chicoutimi. Now, in 1860, there are settlements at Ah-ah bay, and other parts of the river.

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* *See* Chart:—River St. Lawrence, below Quebec, Sheet III., No. 313; scale, $m = 0{\cdot}9$ of an inch: and Plan of Saguenay River, No. 1,370; scale, $m = 0{\cdot}7$ of an inch.

Within the same part of the Saguenay the water is almost as deep as the mountains are high. Between the shoals at the entrance of the river there is a bar across, on which, however, there are from 18 to 20 fathoms water, but immediately within that the depth increases to upwards of 100 fathoms; and farther up, for a distance of many miles, it is fully 145 fathoms deep in the centre of the channel, decreasing to 100 fathoms on either side, often within less than as many feet of the precipitous shores. It is this enormous depth, its mountainous shores, and its impetuous stream, that have rendered the Saguenay so celebrated, and that entitle it to be classed among the most remarkable features in the geography of the Canadas. The bed of the Saguenay, for many miles, is sunk more than 100 fathoms below that of the St. Lawrence at their point of junction; so that if the waters were to fall sufficiently to lay dry the bed of the latter river, there would still remain a depth of more than 100 fathoms in the Saguenay. There are anchorages occasionally, but they are some miles apart, and there is none of course in the great depths between them. In the case of a vessel becalmed, however, there would be little or no danger, since there are no shoals in the channel, when once within the entrance, and a boat a-head would serve to keep her clear of the shore. In some parts, perhaps, but not often, a line might be made fast to the rocks.

The Saguenay is navigable for the largest ships to Roches point, 57 miles from the St. Lawrence; and schooners, with the assistance of the flood tide, can ascend to Chicoutimi, 8 miles farther. Just above Roches point the river becomes suddenly very shoal, there being only 1¼ fathoms water in its narrow and intricate channels, and among its shoals composed of large boulders. Above this shallowest part, where at low water there is a complete rapid, the depth varies from 2 to 8 fathoms, but between shoals of large stones, and the river contracts to little more than a quarter of a mile, retaining that breadth nearly to the rapids, 6 miles above Chicoutimi, where the tide ends.

The Saguenay discharges the water of Lake St. John, contributing to the St. Lawrence a quantity of water only inferior to that which is supplied by the Ottawa.

TIDES.—It is high water, full and change, at Tadousac, at the entrance of the Saguenay, at 2h. 45m., and the rise in ordinary springs is 17 feet, and in neaps 10 feet. At Chicoutimi it is high water at 4½ hours, and the rise in ordinary spring and neap tides is 12 and 8 feet.

If ever this river becomes frequented by vessels, the assistance of steamers will be required, for the flood tide is extremely weak, and of short

duration. Above St. Marguerite river it is almost imperceptible, excepting a weak stream which may be found running up close to the shores. The water, however, has often been observed to be flowing up at the depth of several fathoms, whilst it was stationary or descending on the surface. The tide flows to the foot of the Terres Rompues Rapid, about 6 miles above Chicoutimi, and about 71 miles from the St. Lawrence. The stream of the ebb tide is very strong, varying from 3 to 5 knots, according to the breadth of the river. It is strongest in the mouth of the river, where it sometimes runs at the rate of 7 knots, and sets strongly over Lark Islet spit and the south-west extremity of Vaches point.

The meeting of the spring ebb tides down the Saguenay and the St. Lawrence causes breaking and whirling eddies and ripplings, so strong as to interfere with the steerage of a vessel, unless she has a commanding breeze. These streams, opposed to a heavy easterly gale, cause an exceedingly high, cross, and breaking sea, in which no boat could live, and which is even considered dangerous to small vessels. On the flood tide, at such times, there is not more sea there than in other parts of the river.

ENTRANCE of the SAGUENAY.—The river Saguenay enters the St. Lawrence opposite Red and Green islands, as see page 257, wherein has been described its points of entrance (Lark point and Vaches point), Lark islet, and the reefs off them, together with the leading marks and buoys for clearing them, as far as required for the guidance of vessels passing up or down the St. Lawrence; also the anchorage of Moulin Baude, 2 or 3 miles to the eastward of Vaches point, and of Basque road to the westward of Lark reef; these anchorages will be of great use to vessels frequenting the Saguenay.

BUOYS.—The entrance of the Saguenay is buoyed as follows:—On the eastern side of the entrance, on Vaches patch, a *black* buoy lies in 2¼ fathoms, with the beacon on Ilot point just open to the westward of the beacon on Rouge point; and Lark point just open to the southward of the beacon on Lark islet. On the Outer patch off the Bar reef a *chequered black* and *white* buoy lies in 3 fathoms, with the north side of the Brandy Pots open to the northward of White island half the breadth of the latter; and the north-west Company's house at Tadousac just shut in behind Rouge point. To the westward of the entrance, the *white* buoy on the outer or southernmost extreme of Lark reef is moored in 4½ fathoms, with Red island lighthouse bearing E. ¾ S., and the diamond beacon on the north-east bank of Tadousac harbour in one with the beacon on Lark islet.

Referring to the Admiralty chart for the shape of the extensive reefs on either side, it will be seen that the entrance channel between the *chequered* buoy, on the Outer patch off the Bar reef, and the *black* buoy on Vaches patch, is nearly a mile wide, and has 18 to 20 fathoms water in it. At the distance of 2 miles within the chequered buoy, Lark Islet spit runs out eastward towards Vaches point, and contracts the channel to about three quarters of a mile. In this narrowest part of the entrance, the depth is 30 fathoms, and immediately within it there is no bottom at 60 or 70 fathoms.

ST. CATHERINE BAY.—On the west side of the entrance of the Saguenay, between Lark islet and Noire point, is St. Catherine bay, in which vessels may anchor, in 20 or 30 fathoms water, out of the strength of the tides, but exposed to a considerable swell in easterly winds. On the north-west side of this bay there are several large iron rings in the steep granitic shore, which were probably used for mooring or heaving down vessels in the time of the French.

TADOUSAC HARBOUR is on the eastern side of the entrance of the Saguenay, and a mile within Vaches point. It is a bay between Rouge and Ilot points, with a sandy beach at its head, and rather more than half a mile wide and a third of a mile deep. The anchorage is in from 7 to 18 fathoms, clay bottom. Vessels ought always to moor, and have a heavy anchor close in shore, for the gusts from the north-west are at times exceedingly powerful, and should the anchor start, there would be little chance of bringing up again before the vessel had dragged her anchor down hill into deep water. Besides, although vessels are here completely out of the regular streams of the tides, yet eddies often set into the bay, causing a vessel to swing round several times in a tide, so that it would be almost impossible to keep a clear anchor.

The shelter is rendered complete in every direction by either land or reefs, excepting for one point between S.E. by S. and S.S.E., and there Red islet, with the south coast beyond it at no great distance, prevent any sea, of consequence even to a boat, from ever entering the harbour.

The Hudson Bay Company's Trading Post, consisting of a good dwelling-house, stores, and a small chapel for the Indians, is situated on a semi-circular terrace of sand and clay, at the head of the bay, and backed by steep, high, and rugged hills of granite. It has a small portion of land around it fit for cultivation. It is the principal of those posts for trading with the Indians which are known by the name of the "King's Posts," and were, in 1829, leased to the Hudson Bay Company. The French explored the Saguenay before the middle of the sixteenth century, and Tadousac soon after became, and remained till the settlement of Canada, their principal post in the St. Lawrence for carrying on the fur

trade with the Indians. The Saguenay is three quarters of a mile wide from Ilot point, the north-west point of the harbour of Tadousac, across to Noire point.

DIRECTIONS.—The buoys now placed at the entrance of the Saguenay will be found of great assistance to a vessel beating into the river, there being no clearing mark for the reefs on the south-west side of the entrance; and if another buoy were added to the Lark Islet spit, vessels might beat in and out at all times with safety. On the north-east or Vaches point side observe, that Ilot and Laboule points in one, bearing N.W. by W. $\frac{1}{4}$ W. just clear the south-west side of Vaches Point reef; Ilot point being the rather low north-west point of the harbour of Tadousac and Laboule a high and round-backed hill, forming a steep headland, 4 miles above Tadousac, and the extreme point seen on the same side of the river.

Winds from S.W., round south, to N.E. will enable a vessel to enter the Saguenay on the flood-tide. The first, which is the prevailing summer wind, will not carry her far up, since she will be becalmed under the mountainous shores; but the north-east wind, or wind up the St. Lawrence, draws also up the Saguenay, and is the only wind which can be depended on for running a vessel up to the anchorages above Tadousac. The north-west wind often blows down the river in furious squalls, especially in the fall of the year.

Being bound to the Saguenay, approach the entrance early on the flood with a breeze which can be depended on, and plenty of daylight to reach the anchorage of Tadousac. Remember that the ebb sets like a rapid over Lark Island spit and Vaches Point reef, and that it is dangerous to be becalmed just within either of them, because the water is so deep that it is difficult to anchor. If night be coming on, or the tide or the wind be unfavourable, anchor off Moulin Baude or in Basque road, according to circumstances, and wait for an opportunity for running in, unless a vessel has a pilot sufficiently skilful to beat her in with safety.

Whether the entrance is approached from the south-west or north-east in either case bring the western points of the Brandy Pots and White islet in one and open to the southward of Hare island, bearing S.S.W. $\frac{3}{4}$ W. Run upon this mark (and it will lead well clear of the Vaches patch and Lark reefs) until Laboule point comes in one with Ilot point, bearing N.W. by W. $\frac{1}{4}$ W., as mentioned above. Haul in now for the last named leading mark, keeping the south-west extreme of Laboule just open, and it will lead in clear of all danger. As soon as the vessel is as far in as Rouge point, she may haul in towards the trading posts and into the harbour, choosing her berth at pleasure, but letting go the outer anchor in 16 fathoms, and the inner one close to the low-water mark; or she

may lay it and secure it within the low-water mark, if that should be preferred as the safer plan. The marks above given, are often difficult to distinguish, but the buoys, supposing them to be securely moored, have rendered them no longer absolutely necessary; since there can be no difficulty with a fair wind in running in between buoys nearly a mile apart.

Anchorages in the Saguenay.

BARQUE COVE, rather more than a mile above Tadousac, and on the same side of the river, is 2 cables deep. A vessel or two might be moored in it.

ST. ETIENNE BAY and RIVER are 10½ miles up the Saguenay, and on its south-west shore. The bay is a mile wide, and forms a harbour where a number of vessels may ride in from 10 to 30 fathoms clay bottom, along the edge of the bank which dries out a third of a mile from the shore.

ST. LOUIS ISLE, 17 miles up the river, forms an excellent anchorage, either under its east end or between it and the south shore; the depth of water being from 10 to 30 fathoms, sand and mud bottom.

ST. BARTHELEMI ISLE, a mile higher up, and on the opposite side of the river, lies close to the mouth of the river Cacard. A vessel or two might be secured there; the place being small, and the depth of water from 6 to 20 fathoms.

ST. JEAN, on the southern shore, and 24 miles up the Saguenay, is a large bay with a small islet off its north-west point. It is 1¾ miles wide and 1½ miles deep. The river St. Jean and several small streams enter at its head. Off these streams, and along the edge of the bank which dries out a quarter of a mile from the shore, there is good anchorage for many vessels, in from 8 to 40 fathoms mud bottom.

ETERNITE, on the same side as St. Jean, and 6 miles higher up the river, is a large cove, half a mile wide and 1¼ miles deep, with a river of the same name at its head. At the head of this cove, vessels may lie securely, in from 8 to 30 fathoms, mud bottom, and as securely land-locked as if they were in a small lake surrounded with mountains.

DESCENTE des FEMMES is a cove 3½ cables long, with a depth of 20 fathoms at its entrance, decreasing to 5 fathoms near its head. Several vessels might lie moored in it in great security. It is 42 miles up the river, and on its northern shore.

Five miles above this cove the Saguenay turns suddenly to the northward, between Cape East and Cape West, but the previous direction of

the river is continued 6 or 7 miles beyond the point last named to the head of Ah-ah bay, 55 miles from the entrance of the river.

AH-AH BAY is 6 miles deep and from 1¼ to 2¾ miles wide, the widest part being at its head where four considerable streams fall into it. The best anchorage is on either side of a small islet joined to the shore at low water in the south-west corner of the bay, and from 7 out to 30 fathoms, clay bottom. There is room for any number of vessels, but they are rather exposed in easterly winds.

PETITES ILES on the northern shore of the river, 52 miles from its entrance, and 4½ above Cape East, are three small rocky islets joined to the shore at low water. The bay on the east side of them forms a small but secure anchorage. The depth of water is from 6 to 17 fathoms, mud bottom. The Saguenay, which is here nearly 2 miles wide and with a depth of 65 fathoms, is contracted to three-quarters of a mile, by a high rocky point projecting from its northern shore, at the distance of 2 miles to the westward; but expands again nearly to the same breadth in the next 3 miles, which is the distance from the high point just mentioned to Roches point. On the north side of the river, from the high point to within a mile of Roches point, there is good anchorage in any depth out to 20 fathoms.

ROCHES POINT is 57 miles from the entrance of the river, and here the navigation ends for shipping, but continues for schooners to Chicoutimi, 8 miles farther, as mentioned in page 304. The river is still 1¼ miles wide at Roches point, but contracts rapidly above it, assuming at the same time the usual character of a river, such as mud-banks on either side dry at low water, shoals of large boulder stones, drift trees, &c. The water also becomes fresh when the tide is out.

CHICOUTIMI RIVER and TRADING POST are on the south side of the Saguenay, and 65 miles from its entrance. This river is the largest tributary to the Saguenay. It falls 40 or 50 feet, through a narrow, rocky, and rugged channel, only a short distance within its entrance.

The Trading Post of Chicoutimi is one of the King's Posts, and leased to the Hudson Bay Company. It stands on the west side of the river Chicoutimi at its confluence with the Saguenay, and consists of a good dwelling-house, store, barn, and inferior buildings. There is also here a small church or chapel, erected by the Jesuit missionaries in the early part of the last century, still kept in repair by the Indians, and visited once or twice in a year by a missionary from Quebec. Several of the early missionaries were buried in this chapel, and their tombstones may yet be seen. There is here a considerable space fit for cultivation.

Potatoes and garden vegetables are raised for the use of the people of the establishment.

From Lake St. John to within 5 or 6 miles of this Post, a distance of 10 or 11 leagues, the Saguenay is said to be so full of heavy rapids as to be exceedingly dangerous to canoes, therefore the longer and more circuitous route up the Chicoutimi, through Lake Kiguagomi, and down the Metabetshuan river is preferred. At the mouth of this last named river, on the south shore of Lake St. John, stands another of the King's Posts, leased by the Hudson Bay Company. It was established first by the Jesuit missionaries in the 16th century, and traces of their cultivation still remain.

No directions are necessary for ascending the Saguenay to the anchorages just mentioned, since there is not a single rock or shoal in the way from Tadousac to the anchorage below Roches point.

The times of high water at the full and change, and the rise of the tides, will be seen on the Admiralty charts.

RIVER ST. LAWRENCE,

QUEBEC TO MONTREAL.

SAULT PASS.—Just above the entrance of the Chaudière river (which is on the southern shore, and 5 or 6 miles above Quebec), the St. Lawrence is rather less than 4 cables wide, between steep, high, and partially-wooded banks, composed of greywackè and slate rocks, and of great beauty. The channel of the river is still farther reduced at low water by rocky shoals, which dry out from the shore on either side. The breadth of the stream is then only $2\frac{3}{4}$ cables, but the depth is nearly 30 fathoms, and the rate of the stream of ebb about 6 knots. This narrow pass is called the Sault; and it is here that the drift-ice packs and forms an ice-bridge, over which a sleigh road is formed almost every winter.*

ANCHORAGE.—At Carouge point, on the northern shore, and about 8 miles above Quebec, there is an excellent anchorage; and the river here begins to expand into a magnificent reach, from 2 to $2\frac{1}{2}$ miles wide, which extends to the westward as far as the eye can reach. The high and steep banks on either side, forming occasionally precipitous headlands, are suited to the grandeur of the stream; while the fields and houses of the peasantry, and the villages, 6 or 7 miles apart, with their stone churches and tinned

* *See* Charts:—River St. Lawrence above Quebec, Sheets 1 to 13 inclusive; scales, $m = 3$ inches: and Plan of Montreal Harbour, No. 1,127; scale, $m = 6$ inches.

steeples, often situated on the projecting points and headlands, form altogether scenery of considerable beauty.

TREMBLE SHOALS.—The navigation of the river is devoid of all difficulty as far as the dangerous shoals of Pointe aux Trembles, on the northern shore, and 18 or 19 miles above Quebec. These shoals extend westward for many miles up the river, leaving a channel between them and the southern shore, in some places only 4 cables wide. Still there are no difficulties in the navigation that may not be easily overcome, even in the largest ships, as high as Port Neuf, which is on the northern shore, and 32 miles above Quebec.

LIGHTS.—A small wooden lighthouse, 20 feet high, and painted white, is erected at St. Croix, on the south shore of the river, a few yards from high water-mark. It shows, at 30 feet above the level of high water, a *fixed white* light, to assist in keeping a vessel in the channel for some distance, up and down the river. In clear weather the light will be seen from a distance of 6 miles.

Two small lighthouses, the upper one of stone, and the lower of wood, both white, are also erected at Port Neuf, on the northern shore of the river. They stand S.W. and N.E. of each other, nearly 180 yards apart, and each exhibit a *fixed white* light, visible at 5 miles. When in one they lead up the Richlieu, through the middle of the channel, to abreast Richlieu islet; after which the two lights on the southern shore, at 1½ miles below Richlieu islet, kept in one, lead through the remainder of the channel.*

RICHLIEU RAPID.—The first great difficulty in the navigation is the Richlieu rapid, which commences just above Port Neuf, and extends nearly to Grondine, 41 miles above Quebec. In the narrowest part of the Richlieu the channel at low water is between extensive shoals of immense boulder stones, and only 460 yards wide. There is water enough for any vessel, but there is only about an hour of very weak stream of flood, while the ebb runs in spring tides at the rate of fully 7 knots. This is, therefore, a difficult and dangerous pass, which, before there were steam tow-boats on the St. Lawrence, used often to cause great delay to vessels in those seasons when westerly winds prevail. The steamers regulate the time of their departure from Quebec so as to arrive at the foot of the Richlieu with the flood tide, and they are assisted by a small light on Richlieu islet on the southern side of the channel, and also by two other lights on the high land to the eastward of the former, and which lead through the upper part of the channel.

* Small wooden square, and white, lighthouses have been recently erected on Langlais point, below Great Chene river; on St. Pierre des Becquets, at Batiscan, Champlain, Cape Magdalen, Port St. Francis, and Pointe du Lac, as will be seen on the Admiralty charts, River St. Lawrence above Quebec, and in the Admiralty Lights List.

TIDES.—At Port Neuf the spring tides rise 14 feet, while at Grondine they only rise 9 feet; there is, therefore, a great difference in the rise of the tides at the foot and head of the Richlieu, namely, 5 feet in 9 miles, so that it seems that the descent in the bed of the St. Lawrence is there very considerable.

The navigation above the Richlieu continues more or less difficult, and is so embarrassed by shoals and large boulders that at Livreur point (opposite the river St. Anne, and 47 or 48 miles above Quebec), the ship channel is reduced to the breadth of 360 yards.

The villages of Champlain and Gentilly are opposite to each other, and 58 miles from Quebec, the former being on the northern and the latter on the southern shore. They may be said to mark the extent of the stream of flood tide, which was not observed above the shoals of Gentilly, where the ordinary springs, unless assisted by an easterly gale, do not rise above 2 or 3 feet. Here also a considerable change takes place in the character of the country, for the high banks, which had continued to form the southern shore of the river all the way from opposite Quebec, turn back into the country, and the shores on both sides become low and of an alluvial appearance.

At the town of Three Rivers, 68 miles above Quebec, the ordinary spring tides rise one foot, and it is high water, full and change, at 11½ hours. In the spring and fall easterly gales often occur with the spring tides, and cause them to rise, it is said, a foot or two higher.

At Pointe du Lac, at the lower entrance of Lake St. Peter, and 75 miles from Quebec, the neap tides are almost imperceptible, and the spring tides, unless assisted by an easterly gale, do not rise above 3 or 4 inches. The effect of the tides may be said to be lost in Lake St. Peter, since no alternate rise and fall of the water, that could be attributed to their influence, was observed among the islands at its head. It would be possible to take the largest vessels to the lower entrance of Lake St. Peter, since 4 fathoms could be carried up by buoying the channel.

LAKE ST. PETER.—The distance up this Lake from Pointe du Lac to the islands is about 18 miles, of which about 4 miles are over a flat of sand and clay, on which there were not more than 11 or 12 feet in the ordinary state of the waters in the summer months, at the time of the Admiralty survey. Since then a ship channel, 300 feet wide, and with 18 feet water in it, has been completed by dredging.

At the western extremity of the flat or bar of the Lake a small light-vessel and buoy are placed, to mark the entrance to the principal channel

through the islands, as well as the deepest water through the Lake. A second light-vessel is moored on the north side of the channel, 3 miles N.E. by N. from Flat island, and a third light is shown from Raisin island.

Besides the flat of Lake St. Peter, there is another impediment to the navigation at La Valtrie bar, about 1½ miles below the two small light-houses on La Valtrie island, the latter being near the northern shore, about 12 miles above Sorel, and 111 from Quebec. The depth of water over that bar has also been increased by dredging from 11 or 12 feet to 18 feet in the ordinary state of the river during the summer months.

The channel above Lake St. Peter is often narrow, and difficult for sailing vessels, and the current, the average rate of which does not exceed 2 or 3 knots, is in some narrow places of considerably greater strength. At the Rapid of St. Mary, just below the city of Montreal, the rate of the current amounts to 7 knots, and used formerly to detain vessels many days waiting for a fair and strong wind to ascend; but the steamers now overcome all such difficulties, reducing the passage up from Quebec, which not unusually occupied weeks, to a certain duration of a few hours. They have been greatly assisted by the lights at Repentigny and Pointe aux Trembles, which have lately been erected, in addition to the light on Bague isle. Moreover, the navigation has recently been much improved by dredging near Pointe aux Trembles, Cape St. Michel, and Vercheres, to make the channel more direct. Also the channel passing south of Vercheres island, which was first shown by the Admiralty survey to be the preferable and deeper channel, has been buoyed and lighted, and is now always used by vessels of large draught, instead of the channel passing north of Vercheres island. In short, the whole river, as well as Lake St. Peter, is now so well buoyed and lighted, that steamers tow vessels night and day without stopping, except in fogs, through the narrowest parts of the channel, and the whole distance (about 138 miles), from Quebec to Montreal, is often accomplished in 24 hours, by leaving Quebec so as to arrive at the Richlieu rapid with the flood tide.

MONTREAL HARBOUR.—The dredges, which, under the able superintendance of Captain Armstrong, have so greatly improved the navigation of the river, have also been successfully employed in deepening the harbour of Montreal, near the wharves in front of the city. The depth is now sufficient for vessels as large as can pass through Lake St. Peter. Immediately above Montreal the navigation for shipping is closed by the commencement of the Rapid of St. Louis. Three-quarters of a mile south of the harbour is the Victoria Tubular Bridge, stretching

across the river from St. Charles point to St. Lamberts. It is 6,600 feet long, and rests on piers 35 feet above the ordinary level of the river. This noble structure, which has been built under great engineering difficulties, owing to the rapidity of the current, and will cost, probably, two millions sterling, is for the Grand Trunk Railroad, which by this bridge is made continuous from Toronto to Portland, a distance of about 560 miles.

DIRECTIONS.—In the long line of river navigation which has been thus briefly described, written directions would be, in most parts, totally unavailing; and, in all cases, could only give, very imperfectly, the same information which is given in the Admiralty plans of the river on the scale 3 inches to the mile. These plans will be of great use in pointing out possible improvements in the navigation, in the selection of the best route to be pursued by vessels, and in buoying and lighting the channels to the best advantage. In some parts, as at the Vercheres islands and Bague isle, where there is a lighthouse, the river is divided into several channels; yet one route alone was pursued to the neglect of the others, which thus became nearly, if not entirely, unknown. As an instance of this, we may refer to the channel to the south of Vercheres island, already mentioned as having been lately buoyed and lighted, and preferred for vessels of large draught.

The lighthouses at Bague isle, La Valtrie, and on the islet in the Richlieu Rapid, are small and portable, so that they may be removed on the approach of winter, and thus escape being carried away by the ice; for in spring those low islets are overflowed, and the ice, moreover, in moving down the river, often packs, forming a "digue" or dam, behind which the waters rise many feet, until their pressure overcomes and bursts through the impediment with such force, that not only buildings would give way before it, but even many trees are often prostrated in the low grounds, and great banks of rolled stones are forced up by the ice on the upper ends of islands which are exposed to the current.

Great damage is sometimes done at Montreal from the ice taking the ground and damming back the water so as to overflow the wharves and storehouses in the lower parts of the city, and thus exposing them to the pressure of the drift ice. Hence it is that vessels cannot winter at Montreal, and that the steamers are sent either to Sorel, at the entrance of the river Richelieu, or to the Boucherville islands, those being the only places where they or other large vessels can be safe from the ice, although there are many places where Durham boats and other small river craft may be secured. There is no doubt but that large stones are moved by the ice, and that the depth of water over shoals will vary in consequence; but from all that can be gathered, there has been no

material change in the main channels of the river for many years. The islands and flats of Lake St. Peter are doubtless extending to the eastward or down the Lake, but without as yet affecting the depth of water in the channel.

Besides the lights which have have mentioned, the navigation is assisted by rough buoys, formed of logs and attached spruce bushes, placed in the most difficult parts of the channel. The numerous leading marks used by the pilots are seldom permanent, or of a nature to admit of such a description as would enable a stranger to distinguish them from many other similar objects in their vicinity. They consist almost always of trees and houses, which can be easily and certainly recognized only by those who have become familiar with every object, and whose local knowledge prevents them from being misled, even although the trees be blown down, or the houses change their colour and appearance at the fancy of the owners, as occasionally occurs. These circumstances confirm what has been before stated as to the inutility of written directions for the navigation of the St. Lawrence, between Quebec and Montreal. But it is a rare thing now to see large vessels sailing in the St. Lawrence above Quebec, especially on the upward passage. The powerful steamers frequently tow several large ships at once, and the commerce between the two cities is never likely in future to be carried on without such assistance, so that the seaman will have little to do with the navigation of his vessel above Quebec.

Positions of Buoys in the River St. Lawrence.

Position.	Which Side of Channel.	Colour.	Depth of Water in Fathoms.	Marks for Buoys.
North extremity of Beaumont shoal (page 283).	South	Black	4	St. Lawrence church, North; point Levi church just open northward of Martiniere point.
West end of Madame island (page 280).	Middle	Red	5½	St. Vallier church S. ¼ E.; a house on the west end of Roux island just open to the northward of Madame island.
Rock on Quarantine Ground (page 285).	North	Chequered black and white	7	North side of the rock; south-west point of Goose island W.S.W.
East end of Grosse Patch (page 284).	Middle	White	2½	North side of Margaret island N.E. b. E. ¼ E.
West end of Margarets tail (page 284).	North	Red	2½	South side of Margaret island N.E. b. E.
West end of Crane island shoal (page 284).	North	Red	3	The two beacons (in sugar loaf forms on the south side of Crane island in one; Middle and Crow islands in one.
North extreme of Bank of St. Thomas (page 272).	South	Black	2	The *red* sugar loaf and *white* diamond beacons, on the south point of Crane island, in one; and Haystack island in one with the west point of Crane island.
South side of Crane island (page 275).	North	Red	3½	Macpherson house N. ¼ E.; St. Ignace church touching the east end of the peninsula.
West end of Beaujeu bank (page 275).	Middle	White	3	The two *white* beacons on Crane island in one; Stone Pillar light-house open two or three sails' breadth to the southward of Goose island reef,
Goose island shoal (page 275).	North	Red	4	Onion island N.W.; south side of Crane island S.W. ¼ W.
East end of the patch, east of Beaujeu bank (page 275).	Middle	White	3	The beacon on the Meadows of Goose island in one with the centre of Onion island; the south side of Crane island S.W. b. W. ¼ W.
Channel patch (page 275).	Middle	Chequered black and white	3	The diamond beacon in the parish of St. Jean, Port Jolie, open to the westward of St. Jean church; the north side of Goose island reef and Stone Pillar in one.
Patch off St. Jean church (page 271).	South	Black	3	The beacon in sugar-loaf form in the parish of St. Jean, port Jolie, in one with the church; the high rock on Goose island reef just shut in behind the south point of the South Pillar.
South-west point of Shoals of St. Roque in the Traverse (page 271).	South	Black	3	St. Roque church E. ¼ N.; the high rock at the south-west extreme of Goose island reef open one or two degrees to the northward of the Stone Pillar.

Positions of Buoys in the River St. Lawrence—continued.

Position.	Which Side of Channel.	Colour.	Depth of Water in Fathoms.	Marks for Buoys.
Middle of shoals of St. Roque in the Traverse (page 271).	South	Black	3½	East end of Coudres island in one with river Eglise, on the north shore, N. ¼ W.; the Wood Pillar shut in its own breadth with the south side of Goose island S.W. ¼ W.
West end of the Middle ground (page 271).	North	Red	3	Two beacons in one in the parish of St. Roque; the Wood Pillar and Goose island touching.
South-east side of the Middle ground (page 271).	North	Red	2½	The beacon to the southward of St. Roque church in one with the centre of Francois Marie Foulards house.
North-east extreme of shoals of St. Roque (page 271).	South	Black	2	The beacon to the southward of St. Roque church in one with the west end of Francois Marie Foulard's house.
North-west of shoals of St. Anne (page 251).	South	Black	2½	St. Anne church S.E. ¼ S.; Cape Diable half open to the northward of St. Denis point.
West end of Hare island bank (page 245).	Middle	Red	4	Two beacons in one on the east end of Grande island of Kamourasca; the north sides of Hare island and Hare island South reef touching.
North extremity of the Pilgrim (page 248).	South	Black	4½	The west end of Hare island and the west end of Great Pilgrim in line N.N.W. ¼ W and S.S.E. ¼ E.; the west end of Brandy Pots and White island touching.
The knoll at the east end of Hare island bank (page 244).	North	Red	3	The south side of Hare island and and the middle of White island in one; the west end of Hare island N.W. ¼ W.
East end of the Middle shoal, off the south side of Hare island (page 246).	Middle	White	10 feet	The square beacon on Hare island open to the westward of the Brandy Pots; the south-west end of Hare island in one with the summit of Eboulemens mountains.
Barrett ledge (page 246).	Middle	Chequered black and white	6	The diamond beacon on Hare island in line with the eastern extremity of the Brandy Pots; the south side of the southernmost mountain of Kamourasca in line with the south point of Great Pilgrim island.
East end of Hare island North reef (page 243).	Middle	Black	4	The beacon in the parish of Cacona open to the eastward of Cacona church; the south side of White islet in one with the north side of Hare island. This beacon open to the westward of the church, leads to the eastward of the east end of Hare island North reef.
East end of Red Islet reef (page 242).	Middle	Red	5½	The south side of Red islet in one with the north side of Hare island; the beacon on Green island open a little to the westward of the Lighthouse S.S.E. ¼ E.
West end of Red islet (page 243).	Middle	Red	2½	The lighthouse on Red islet E. b. N. ¼ N.; the beacon on the north side of Red islet in one with the south-west corner of the keeper's dwelling-house.

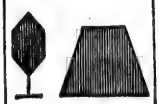
Positions of Buoys in the River St. Lawrence—*continued.*

Position.	Which Side of Channel.	Colour.	Depth of Water in Fathoms.	Marks for Buoys.
Vaches patch (entrance of river Saguenay (pages 288, 303).	North	Black	2½	The beacon on Ilot point, just open to the westward of the beacon on Rouge point; Lark point, just open to the southward of the beacon on Lark island.
Outer patch (pages 288, 303).	North	Chequered black and white.	3	White island, half its breadth shut with the north side of the Brandy Pots; the north-west Company's house, in the harbour of Tadousac, just shut behind Rouge point.
South-west extreme of Lark reef (pages 288, 305).	North	White	4½	Red island lighthouse, E. ¼ S.; the diamond beacon, on the north-east bank of the harbour of Tadousac, in one with the beacon on Lark island.
North extreme of Prairie shoal (page 294).	South	Black	3	St. Pierre church, open its own breadth with the east side of St. Pauls bay N.W. ¼ W.; Notre Dame church in one with the south part of St. Joseph point E.N.E.
East end of Brulé bank (page 296).	South	Black	3	The west end of Two heads island, and the west end of Burnt Cape ledge, in one S. ¼ E.; Cape Tourmente W.S.W.
North-west side of Brulé bank (page 296).	South	Black	3	The west end of Two heads island, and the east end of Margaret island, touching S.E. b. E. ¼ E.; the west end of Grosse island S. b. E. ¼ E.
East end of Traverse spit (page 296).	North	Red	3	The west end of Two heads island, and the east end of Margaret island, just open S.E. b. E. ¼ E.; west end of Grosse island S.S.E.
East end of the West Sand (page 296).	Middle	Chequered black and white.	3	Patience island and Two heads island touching E. ¼ S.; Berthier church just open to westward of Rouge island S. ¼ W.

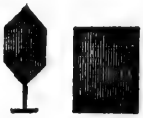
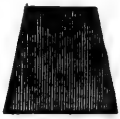
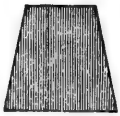
Positions of Beacons in the River St. Lawrence.

Position.	Which Side of Channel.	Colour.	Form.	Remarks.
Parish of St. Vallier (page 286).	South	White		When in one with the church, forms a cross mark for south-west end of Madame reef, in 6 fathoms.
Crane island, on the south point.	North	Red		These two beacons in one, form a mark for the *red* buoy on the western extremity of Crane Island spit.
Crane island, about one cable's length to the westward of Red beacon (page 284).	North	White		

Positions of Beacons in the River St. Lawrence—*continued.*

Position.	Which Side of Channel.	Colour.	Form.	Remarks.
Crane island, one cable's length to eastward of Red beacon (page 272).	North	White		When in one with the *red* beacon, form a mark for the *black* buoy on the north extremity of the Bank of St. Thomas.
Crane island, about 1¼ cables' lengths to the S.W. of Macpherson house (2), (page 275).	North	White		When in one, form a cross mark for the *white* buoy on the west end of Beaujeu bank.
Meadows of Goose island (page 275).	North	White		When in one with Onion island, forms a cross mark for the *white* buoy on the patch east of Beaujeu bank.
Parish of St. Jean, Port Jolie, to the south-east of the church (page 271).	South	White		When in one with the church, forms a cross mark for the *black* buoy on St. Jean patch.
Parish of St. Jean, Port Jolie, to the south-east of the church (page 271).	South	White		When in one with the church, forms a cross mark for the *Chequered* buoy on the Channel patch.
Parish of St. Roque (2), (page 271).	South	White		The diamond beacon stands to the south-eastward of the other, and when in one, forms a mark for the *red* buoy on the 3-fathoms patch on the north side of the Traverse.
Parish of St. Roque (page 271).	South	White		When open its own breadth to the westward of the church, forms a cross mark for the light ship; when in one with the centre of Francois Marie Foulard's house, forms a cross mark for the north-east *red* buoy in the Traverse; and when in one with the west end of Foulard's house, forms a cross mark for the *black* buoy on the northern extremity of St. Roque shoal.

Positions of Beacons in the River St. Lawrence—*continued.*

Position.	Which Side of Channel.	Colour.	Form.	Remarks.
Great Island of Kamourasca (2), (page 249).	South	1 Red 1 White		They bear N. ¼ W. and S. ¼ E. of each other, and when in one form a cross mark for the *red* buoy on the south-west end of Hare Island bank in 4 fathoms.
Hare Island (page 246).	North	White		The one in diamond form when in one with the eastern extremity of the Brandy Pots, forms a cross mark for the *chequered* buoy on the west rock of Barrett ledge; the *square* one when open to the westward of the Brandy Pots, forms a cross mark for the *white* buoy on the Middle shoal, east end of Middle bank.
Parish of Cacona (page 243).	South	White		When open to the eastward of the church, forms a cross mark for the *black* buoy on the east end of Hare island North reef; when open to the westward of the church, forms a clearing mark for the east end of same reef.
Green Island (page 242).	South	White		When open westward of Green Island lighthouse, forms a mark for the *red* buoy on the east end of Red Island shoal; when in one with the lighthouse, will clear the east end of Red Island shoal.
North-east bank of Tadousac harbour (page 305).	North-east.	White		When in one with the beacon on Lark island, forms a mark for the *white* buoy on the south-west extremity of Lark reef.
River Saguenay, Ilot point (page 305).	North-east.	White		
River Saguenay, Rouge point (page 305).	North-east.	White		When open to the eastward of the beacon on Ilot point, forms a mark for the *chequered* buoy on Vaches patch.
Lark Islet (page 305).	South-west.	White		When open to the northward of Lark point, forms a mark for the chequered buoy on Vaches patch; and in one with the diamond beacon on the north-east bank of Tadousac harbour, forms a mark for the white buoy on the south-west extreme of Lark reef.

POSITIONS OF BEACONS IN THE GULF OF ST. LAWRENCE.

POSITION.	Height.	Colour.	Form.	——
Island of Anticosti, South point (page 73).	40 feet	White		Lat. 49° 3′ 43″ N.; Long. 62° 16′ W.
Island of Anticosti, Pavillon river (page 73)	40 feet	White		Lat. 49° 9′ 45″ N.; Long. 62° 50 W.
Island of Anticosti, 6 miles East of Salt Lake Bay (page 73).	40 feet	White		Lat. 49° 17′ 30″ N.; Long. 63° 16′ W.
Island of Anticosti, Cape St. Mary (page 75).	40 feet	White		Lat. 49° 40 30′ N.; Long. 63° 55′ W.
Harbour of Quebec; on the hill in rear of Diamond harbour (page 290).	North side of Channel.	White		When open eastward of the Mortella tower, forms a mark for the eastern limit of the Ballast Ground.

TABLE OF POSITIONS

IN THE

GULF AND RIVER OF ST. LAWRENCE, ON THE SOUTH-EAST COAST OF NOVA SCOTIA, AND IN NEWFOUNDLAND, CORRECTED TO 1860, BY REAR ADMIRAL BAYFIELD.

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs.
		° ′ ″	° ′ ″	h. m.	ft.
ST. PAULS ISLAND.					
St. Pauls Island -	North extreme -	47 13 55	60 8 20	8 0	5¼
Ditto - -	East side of Neck -	47 13 9	60 8 30	—	—
Ditto - -	Light-house, north end - - -	47 13 50	60 8 20	—	—
Ditto - -	Light-house, south end - - -	47 11 20	60 9 36	—	—
MAGDALEN ISLANDS.					
North Bird Rock -	Centre - - -	47 50 57	61 9 15	—	—
Byron Islands -	East point - -	47 47 53	61 24 37	—	—
East Island - -	70 fathoms north-west of eastern extreme - -	47 37 33	61 23 07	—	—
Amherst Harbour -	North side of entrance	47 14 23	61 49 26	8 20	3 0
Entry Island - -	North-west point; end of grassy bank	47 17 1	61 42 59	—	—
Deadman Rock -	West point - -	47 16 3	62 12 25	—	—
ANTICOSTI ISLAND.					
West Point - -	South-west extreme of the headland at high water -	49 52 12	64 32 05	—	—
Cape Henry -	South-east extreme -	49 47 42	64 22 41	1 40	7
South-west Point -	Light-house - -	49 23 45	63 35 46	—	—
South Point - -	High-water mark -	49 3 35	62 15 30	—	—
Heath Point - -	Light-house - -	49 5 20	61 41 48	—	—
East Point - -	Extreme - -	49 8 17	61 40 00	1 0	5
Bear Bay - -	Entrance of river -	49 30 22	62 24 30	1 10	5¼
Observation Cape -	West side, near rivulet - -	49 38 51	62 41 24	—	—
North Point - -	Ditto, high water mark - -	49 57 32	64 8 58	—	—

x 2

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs.
		° ′ ″	° ′ ″	h. m.	ft.
NEWFOUNDLAND; EAST COAST.					
St. Johns Harbour	Chain Rock battery	47 34 2	52 40 50	7 30	7
Ditto - -	St. Johns church cupola - -	47 33 52	52 42 03	—	—
Ditto - -	Jones Stone, in Fort Townsend - -	47 33 57	52 42 18	—	—
NEWFOUNDLAND; SOUTH COAST.					
Cape Pine - -	Lighthouse - -	46 37 4	53 31 45	—	—
Cape Race - -	South extreme -	46 39 12	53 2 40	—	—
Trepassey Harbour	Shingle Neck - -	46 43 32	53 22 20	7 0	6½
NEWFOUNDLAND; WEST COAST.					
Cape Ray - -	South extreme -	47 37 02	59 18 15	—	—
Cod Roy Island -	South side of Boat harbour - -	47 52 30	59 23 52	—	—
Red Island - -	Shingle, south-east point - - -	48 33 50	59 13 23	—	—
Port Saunders -	North-east point of entrance - -	50 38 28	57 18 00	10 30	—
Rich Point - -	Western extreme, high water - -	50 41 39	57 24 20	—	—
Ferrole Point -	Cove point, north-east extreme -	51 2 14	57 2 45	—	—
Green Island - -	1½ cables from north-east end - -	51 24 10	56 33 50	—	—
Cape Norman -	North side of point of Cove, South of east extreme -	51 37 57	55 53 25	—	—
GULF OF ST. LAWRENCE; NORTH COAST.					
Belle-isle - -	North-east point (magnetic) - -	52 1 8	55 15 30	—	—
Ditto - -	Lighthouse - -	51 53 0	55 22 15	—	—

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs.
		° ′ ″	° ′ ″	h. m.	ft.
Cape St. Lewis -	Small peninsula on south-east point -	52 21 16	55 38 25	6 30	
Battle Islands -	North-east extreme of south-east island - - -	52 15 36	55 32 20	—	
Henley Island -	Middle of north side	52 0 0	55 50 30	7 35	
York Point - -	East extreme - -	51 57 53	55 52 50	—	
Red Bay - -	Harbour island, south-east point	51 43 47	56 25 30	7 45	
Loup Bay - -	Flag-staff at head of bay - - -	51 31 27	56 48 55	—	
Forteau Bay - -	South-west extreme of point - -	51 25 29	56 56 30	—	
Amour Point - -	Lighthouse - -	51 27 35	56 50 53	—	
Bradore Hills - -	North-west hill, 1,264 feet high, the Notre Dame of Cook and Lane	51 35 3	57 11 55	—	
Ditto - -	South hill, 1,135 feet	51 33 54	57 11 40	—	
Ditto - -	Middle or North-east hill	51 34 49	57 10 55	—	
Greenly Island -	North-east point -	51 23 11	57 10 40	—	
Bradore Harbour -	Flag-staff on Jones house - -	51 27 30	57 14 12	8 45	
Belles Amours Point	South-east extreme -	51 26 34	57 25 50	9 00	
Lion Island - -	Isthmus - -	51 24 1	57 38 30	9 15	
Mistanoque Island -	East point of cove in North side island	51 15 43	58 12 15	10 30	6
Mecattina Harbour	South point of Dead Cove - -	50 46 44	58 59 20	—	
Grand Mecattina Point - -	South-east extreme -	50 44 2	59 0 10	—	
Antrobus Point -	North point of island	50 33 12	59 16 45	—	
Hare Harbour -	East side. (see chart)	50 36 24	59 17 20	—	
Wapitagun Harbour	East point of islet on southern side of anchorage -	50 11 40	60 01 20	10 30	5
Cape Whittle -	South-west extreme of Lake island -	50 10 36	60 07 00	—	

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs
		° ′ ″	° ′ ″	h. m.	ft.
Coacoacho Bay -	South point of outer islet - -	50 9 4	60 18 10	10 30	5
Kegashka Bay -	Islet at south end of the beach - -	50 11 19	61 15 35	10 45	5
Natashquan River -	Southern point of entrance - -	50 6 57	61 47 55	—	—
Little Natashquan Harbour - -	North point islet at head of bay -	50 11 41	61 50 30	11 00	5
Nabesippi River -	First Granite point south-east of entrance - -	50 13 52	62 13 00	—	—
Watcheeshoo Peninsula - -	Summit - -	50 16 18	62 41 10	—	—
Appetetat Bay -	East point - -	50 16 35	62 58 10	11 10	5
Betcheween Harbour	South-east point of Low isle - -	50 14 13	63 10 29	11 30	5
Clearwater Point -	South-west extreme -	50 12 27	63 27 03	11 30	5
Mingan Harbour -	Sandy point - -	50 17 24	64 01 53	1 16	6
Mingan Island -	Summit - -	50 12 48	64 7 28	—	—
St. John River -	East point of entrance	50 17 3	64 20 13	1 20	7
Manitou Point -	Extreme - - -	50 17 34	65 14 05	—	—
St. Charles Point -	South extreme at high water - -	50 15 17	65 48 45	—	—
Moisie River -	South-west point of entrance - -	50 11 16	66 4 35	—	8
Carousel Island -	South extreme -	50 5 21	66 23 30	1 30	—
Seven Islands Bay -	Store-house, east side	50 13 0	66 24 01	1 40	9
St. Margaret Point	Extremity - -	50 2 25	66 44 40	—	—
Cawee Islands -	West point of Little island - -	49 49 21	67 01 50	1 50	9
Egg Islands - -	West point of North island - -	49 38 13	67 10 03	2 00	11
Trinity Bay - -	South-west point -	49 23 39	67 18 05	1 55	—
Point de Monts -	Lighthouse - -	49 19 35	67 21 55	—	—
Do. - -	South extreme -	49 18 41	67 23 15	12 00	12

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs.
		° ′ ″	° ′ ″	h. m.	ft.
RIVER ST. LAWRENCE; NORTH SHORE.					
Goodbout River	Trading post	49 18 25	67 36 01	1 52	—
St. Nicholas Harbour	Cross point	49 18 26	67 46 34	1 55	—
St. Nicholas Point	South extreme	49 15 47	67 50 01	—	—
St. Giles Point	Extreme	49 12 26	68 8 54	—	—
Manicouagon Point	South-east extreme	49 6 05	68 11 52	2 00	—
Bersimis River	South point of entrance	48 55 23	68 36 51	2 00	—
Bersimis Point	South extreme	48 53 57	68 38 26	—	—
Jeremy	Trading post	48 52 45	68 46 43	—	—
Port Neuf	Church	48 37 17	69 5 50	2 10	—
Tadousac (Saguenay River)	Store on beach	48 8 32	69 42 49	2 45	17
Chicoutimi (Saguenay River)	Trading post	48 26 05	71 4 48	5 11	—
Isle aux Coudres	West point of Laprairie bay	47 24 40	70 24 49	4 25	—
Quebec	North Bastion	46 49 00	71 12 46	6 38	17½
Do.	Wolf Monument	46 48 38	71 12 28	—	—
Do.	Flag staff, Kings Bastion, Citadel	46 48 32	71 12 30	—	—
RIVER ST. LAWRENCE; ABOVE QUEBEC.					
St. Jean des Chaillons	R. C. Steeple	46 33 23	72 7 06	—	—
Cap Madeline	R. C. Steeple	46 22 06	72 30 03	—	—
Three Rivers	Easternmost Steeple	46 20 43	72 32 18	—	—
Point du Lac	R. C. Steeple	46 17 21	72 41 26	—	—
Sorel	Episcopal Church	46 2 42	73 6 57	—	—
Repentigny	R. C. Steeple	45 44 28	73 26 56	—	—
Montreal	Light-house, Gate Island, North end	45 30 22	73 33 14	—	—
Do.	R. C. Cathedral	45 30 24	73 33 27	—	—

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs.
	RIVER ST. LAWRENCE; SOUTH SHORE.	° ′ ″	° ′ ″	h. m.	ft.
Cape Despair -	Extreme - - -	48 25 22	64 18 29	—	—
Gaspé Basin - -	Sandy Point, N.W. side of Narrow entrance - -	48 49 45	64 28 45	2 40	5
Cape Gaspé - -	Flower-pot Rock -	48 45 2	64 9 26	—	—
Cape Rozier - -	Extremity seen from Cape Gaspé -	48 51 37	64 11 52	—	—
Do. - -	Lighthouse - -	48 51 37	64 12 0	—	—
Great Fox Bay -	Centre of - -	48 59 57	64 22 52	2 0	—
Mount Louis River -	East point of entrance	49 14 29	65 43 30	2 0	—
Cape Chatte - -	Extreme - - -	49 5 52	66 45 13	—	—
Matan River - -	Inner S.W. point of entrance - -	48 51 35	67 31 21	2 15	11
Metis - - -	Reef off Little Metis	48 41 10	68 01 31	2 20	—
Camille Mount -	Summit, 2,036 feet above high water springs -	48 28 36	68 12 47	—	—
Barnaby Island -	N.E. point - -	48 29 35	68 31 53	—	—
Bic Island - -	N.E. extreme of S.E. reef - -	48 25 9	68 48 20	2 15	14
Bicquette Island -	Lighthouse - -	48 25 18	68 53 00	—	—
Razade Rocks -	N.E. rock - -	48 12 27	69 8 00	—	—
Green Island - -	Lighthouse - -	48 3 17	69 25 03	2 45	16
Red Island - -	Lighthouse - -	48 4 20	69 32 56	—	—
Loup River - -	N. point of entrance	47 50 57	69 33 38	3 7	—
Brandy Pots - -	S. point of South rock	47 52 28	69 40 36	3 6	17
Kamouraska - -	N.E. point of Crow Island - -	47 35 9	69 52 36	4 0	—
Stone Pillar Island -	Lighthouse - -	47 12 25	70 21 36	—	—
Crane Island - -	Station on beach, ¼ mile S.W. of Macpherson -	47 4 22	70 31 10	5 20	—
Dauphin River, Orleans Isle -	S.W. point of entrance	46 58 4	70 50 41	5 40	—

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs.
	GULF OF ST. LAWRENCE; SOUTH COAST.				
		° ′ ″	° ′ ″	h. m.	ft.
Macquerau Point -	N.E. extreme - -	48 12 18	64 46 11	2 0	5
Port Daniel - -	N. side of West point	48 9 10	64 56 52	—	—
Paspebiac - -	S. extreme of sandy spit, high water -	48 0 46	65 14 15	2 45	—
Ditto - -	Episcopal church -	48 1 47	65 15 03	—	—
Bonaventure Point -	South extreme - -	48 0 17	65 26 23	—	—
Carlton, or Tracadigash Point -	N.W. extreme - -	48 5 9	66 7 07	3 00	6
Dalhousie Island -	East point - -	48 4 16	66 21 23	3 15	8½
Black Rock - -	Station on it - -	47 51 54	65 45 27	—	—
Bathurst Harbour -	Carrou point, E. side of entrance -	47 39 19	65 36 56	3 15	7
Mizzenette Point -	Station - - -	47 50 2	64 58 40	—	—
Caraquette Island -	S.E. extreme of sandy spit - -	47 49 19	64 51 42	2 40	6
Shippigan Harbour	Falls Wharf - -	47 44 52	64 42 09	3 40	6
Miscou Island -	Green Mound on N. extreme - -	48 1 29	64 31 44	2 30	—
Ditto - - -	Lighthouse - -	48 1 00	64 29 25	—	—
Shippigan Gulley -	N. side entrance -	47 43 24	64 39 33	3 0	—
Miramichi - -	Bai du Vin island, N.E. extreme -	47 6 19	65 4 18	—	—
Ditto - -	Ditto, S.W. extreme	47 5 0	65 6 46	5 50	5
Ditto - -	Mid. island, N.W. extreme - -	47 3 15	65 27 12	—	—
Escuminac Point -	Lighthouse - -	47 4 32	64 47 33	4 10	—
Richibucto River -	N. Beacon at entrance	46 43 4	64 47 48	irregular.	—
Buctouche River -	Station on Rocky point at entrance	46 26 55	64 38 01	„	—
Cocagne Head -	Extremity of cliff -	46 21 31	64 31 57	„	—
Shediac Island -	Station on Sandy S.W. extreme -	46 15 2	64 32 07	„	—
Shediac - -	Episcopal Church -	46 14 15	64 33 48	„	—

Place.	Particular Spot.	Latitude North.	Longitude West.	H. W. full and change.	Rise in Springs.
		° ′ ″	° ′ ″	h. m.	ft.
Cape Tormentine -	N.W. extreme of the Joureman Islands	46 10 6	63 49 23	10 0	—
Indian Point - -	Station on extreme -	46 6 16	63 46 10	—	—
Tignish Head, in Bay Verte -	Station - - -	46 0 28	64 1 15	10 30	—
Pugwash Point -	High water extreme -	45 52 45	63 40 03	10 30	7
Pugwash - -	Episcopal church -	45 51 14	63 39 34	—	—
Palmer Point, Wallace Harbour -	High water extreme	45 49 19	63 25 26	10 30	8
Amet Island - -	East extreme - -	45 50 15	63 9 56	—	—
Pictou Harbour -	Lighthouse - -	45 41 25	62 39 26	10 0	6
Pictou Island -	Station, sandy point, S. side - -	45 48 21	62 33 10	—	—
Ditto - -	Lighthouse, East end	45 49 50	62 30 10	—	—
Merigomish Harbour	Point Betty Olding island, S.E. extreme	45 38 29	62 26 40	10 6	5¼
Cape George - -	Station in Ballentine Cove - -	45 51 49	61 54 48	9 15	4
Antigonish Harbour	N. beacon - -	45 41 49	61 53 12	9 0	4
Pomquet Island -	S.E. extreme - -	45 39 17	61 44 21	9 15	—
Gut of Canso -	Lighthouse, North entrance - -	45 41 42	61 28 58	9 15	4½
	PRINCE EDWARD ISLAND.				
North Point - -	Extreme of cliff -	47 3 41	63 59 19	3 30	—
West Point - -	High water extreme -	46 37 14	64 23 16	6 30	4
Cape Egmont -	Station on extreme -	46 24 11	64 07 55	—	—
Fifteen Point -	R. C. church steeple-	46 23 31	64 01 55	—	—
Miscouche - -	Ditto - -	46 26 4	63 51 50	—	—
Seacow Head -	Station on extreme -	46 19 0	63 48 30	—	—
Carleton Head -	On extreme of cliff -	46 15 4	63 42 15	9 45	—
Bedeque Harbour -	Green's wharf - -	46 23 32	63 47 26	10 00	7
Cape Traverse -	Station on extreme of cliff - -	46 13 17	63 39 07	—	-

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs.
		° ′ ″	° ′ ″	h. m.	ft.
St. Peters Island -	Station South-west extreme - -	46 6 59	63 11 45	—	—
Charlottetown -	Flagstaff on fort -	46 13 55	63 07 23	10 45	9½
Elliot River - -	Nevon point - -	46 12 24	63 19 41	—	—
Hillsborough River-	Portage station -	46 20 25	62 56 31	—	—
Prim Point - -	Lighthouse - -	46 3 10	63 2 06	10 0	—
Wood Islands -	Eastern extreme of Westernmost island	45 57 8	62 44 47	9 45	—
Cape Bear - -	Station on high rock	46 0 18	62 27 10	9 0	6
George Town Harbour - -	Gaudien Point -	46 10 53	62 31 59	8 40	5
Panmure Island -	Lighthouse - -	46 8 47	62 27 40	—	—
Boughton Island -	South-east extreme -	46 10 54	62 23 30	—	—
Dean Point - -	Station - - -	46 20 55	62 10 44	—	—
East Point - -	Station on extreme of cliff - -	46 27 15	61 57 58	8 30	3¾
Savage Harbour -	Station on Coffin point	46 26 7	62 51 20	8 30	4
St. Peters Harbour-	Sand hill, Eastern side of entrance	46 26 44	62 44 12	8 30	4
Tracadie Harbour -	Eastern point of entrance - -	46 24 51	63 2 00	7 0	—
Grand Rustico -	Western point of entrance - -	46 27 27	63 17 09	6 40	—
Cape Turner - -	Northern extreme	46 29 51	63 19 10	6 10	—
Grenville Harbour -	High sand hill near entrance - -	46 30 50	63 27 45	6 10	3½
Richmond Bay -	Station on Royalty point - - -	46 33 55	63 42 06	6 0	3
Bunbury Island in Richmond Bay -	North-east extreme -	46 32 8	63 46 44	8 17	—
St. Eleanors - -	Episcopal church -	46 25 18	63 48 23	—	—
Cascumpeque Harbour - -	Beacon, North side of entrance -	46 48 16	64 2 15	5 40	3
Ditto - -	Lighthouse - -	46 48 22	64 2 15	—	—
Cape Kildare - -	Station on extreme -	46 52 57	63 58 00	—	—

Place.	Particular Spot.	Latitude North.	Longitud West.	H. W full and change.	Rise in Springs.
CAPE BRETON ISLAND; SOUTH COAST.					
		° ′ ″	° ′ ″	h. m.	ft.
Michaux Point -	Station on extreme -	45 34 11	60 41 00	8 00	5
L'Ardoise - -	R. C. church steeple -	45 36 45	60 45 59	—	—
St. Peter Island -	South-west extreme -	45 35 54	60 48 39	—	—
St. Peter Bay -	Old fort on West side of Haulover -	45 39 21	60 52 04	7 43	—
MADAME ISLAND.					
Grande-digue Point in Lennox Passage	Station - -	45 35 49	61 1 11	7 55	6½
Arichat Harbour -	Observation Station -	45 30 21	61 3 06	—	—
Ditto -	Jerseyman island, North extreme -	45 30 25	61 3 07	8 10	4½
Ditto -	R. C. church steeple -	45 30 48	61 1 47	—	—
Ditto -	Lighthouse, Marache point - -	45 29 2	61 1 52	—	—
CAPE BRETON ISLAND; SOUTH AND WEST COASTS.					
Bear Head - -	Station on extreme -	45 33 5	61 17 05	—	—
Plaster Cove -	Station near North end of Bridge -	45 38 56	61 23 36	9 10	4½
M'Keen Point -	Station on extreme -	45 38 51	61 23 54	—	—
Port Hood - -	Station, Smith I. -	46 0 57	61 33 40	9 0	4½
Ditto - -	Harbour light at South entrance -	46 0 0	61 31 40	—	—
Sea Wolf Island -	North extreme -	46 22 3	61 15 07	—	—
Ditto - -	Lighthouse on summit - - -	46 21 30	61 15 33	—	—
Chetican Point -	South extreme - -	46 36 22	61 2 58	8 15	3½
Cape St. Lawrence -	North extreme - -	47 2 54	60 35 36	—	—
Cape North - -	North extreme - -	47 2 35	60 24 56	—	—

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs.
CAPE BRETON ISLAND; NORTH-EAST AND SOUTH-EAST COASTS.					
		° ′ ″	° ′ ″	h. m.	ft.
Cape Egmont	East extreme	46 51 1	60 18 03	8 0	—
Inganish	Archibald Point	46 41 31	60 21 18	8 12	4
St. Anne Harbour	Station on Beach point	46 17 31	60 32 25	8 34	5½
Carey Point	West side of entrance of Great Bras d'or	46 17 41	60 24 50	7 30	3
Cunet Point	Station near extreme	46 20 32	60 17 16	—	—
Sydney Harbour	Lighthouse on Flat Point	46 16 12	60 7 22	—	—
Ditto	Station on South-east Bar	46 12 25	60 12 40	8 15	3¾
Ditto	Shingle point, opposite the town	46 8 21	60 12 05	8 15	5
Table Head	Station on extreme	46 13 14	59 57 04	—	—
Flint Island	Station	46 10 55	59 46 01	—	—
Ditto	Lighthouse on N.E. end	46 11 05	59 45 50	—	—
Scatari Island	Lighthouse	46 2 13	59 40 18	—	—
Menadou Harbour	Station	46 0 29	59 49 58	8 15	5½
Cape Breton	Station on extreme	45 57 14	59 47 03	—	—
Gabarus Bay	Church on Cape	45 49 07	60 5 03	—	—
Louisburg	Lighthouse	45 54 34	59 57 15	8 00	5
CAPE BRETON ISLAND; IN THE BRAS D'OR LAKE.					
Man of War Point	Station	46 11 20	60 33 00	—	—
Boulardrie Island	Station on Kemp head	46 4 33	60 39 45	—	—
Grove Point	Station	46 13 36	60 20 36	—	—
Kelly Point	East side, entrance of Strait of Barra	45 57 40	60 47 35	—	—

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs.
		° ′ ″	° ′ ″	h. m.	ft.
Indian, or Chapel Island - -	Cross Station - -	45 43 13	60 46 55	Tides	
St. Peter - -	Station on hill, North-east side of Haulover - -	45 39 30	60 51 47	not observ-	
Red Island - -	North extreme -	45 48 35	60 46 18	able	
Head of E. Bay -	Last station - -	46 1 55	60 21 19		
Spanish River -	Forks bridge - -	46 4 11	60 16 50	within	
Malagawatcht Point	Station on extreme -	45 52 17	60 54 36	the	
N. side of W. Bay -	New Station, near North Mountain	45 50 22	60 59 24	Strait	
Ditto - -	Station on Calder hill - - -	45 45 28	61 10 16	of	
Ballam Head -	Station - - -	45 42 36	61 6 57	Barra.	
Morrison Head -	Station - - -	45 46 23	60 53 49		

NOVA SCOTIA; SOUTH-EAST COAST.—HALIFAX TO GUT OF CANSO.

Halifax - - -	Dock Yard Observatory - - -	44 39 38	63 35 10	7 49	6
Halifax Harbour -	Lighthouse Maugher beach - -	44 36 6	63 31 55	—	—
Mars Head - -	Station on extremity	44 26 16	63 43 27	—	—
Sambro Island -	Lighthouse - -	44 26 11	63 33 42	—	—
Devil Island - -	Lighthouse - -	44 34 48	63 27 27	—	—
Laurenceton Head -	Station on summit -	44 38 34	63 21 10	—	—
Grahams Head -	Station on summit -	44 37 44	63 16 58	7 30	—
Story Head - -	Station on summit -	44 40 11	63 13 06	—	—
Perpisawick Head -	Station on summit -	44 40 48	63 9 25	—	—
Jedore Head - -	Station on point -	44 40 22	63 2 49	—	—
Jedore Rock - -	Station on centre -	44 39 49	63 0 32	—	—
Jedore Harbour -	Station on Marsh point	44 43 19	63 0 14	7 45	6½
Egg Island - -	Station near centre -	44 39 55	62 51 44	—	—
Ship Harbour -	Islet near Salmon Point - -	44 47 00	62 48 58	7 54	6¼

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs.
		° ′ ″	° ′ ″	h. m.	ft.
Ship Harbour (outside)	Station on Day point	44 45 38	62 47 50	—	—
Charles Island	Station 300 fathoms west of Bogle bluff	44 46 03	62 43 31	—	—
Pope Harbour	Harbour Island, North-east extreme	44 47 51	62 38 45	7 40	6½
Taylor Head	Station on summit	44 47 25	62 32 43	7 40	—
Sheet Harbour	Station a quarter of a mile N.W. from Watering Cove	44 54 11	62 30 12	8 6	6¾
Beaver Harbour	Station on hill	44 52 18	62 25 17	7 40	6½
Salmon River	Station on Breading point	44 54 16	62 23 18	—	—
Salmon River	Station 100 fathoms west of wharf	44 54 32	62 23 08	—	—
Beaver Island	Lighthouse	44 49 34	62 20 13	—	—
Mary Joseph Harbour	Lobster point extreme	44 57 53	62 04 31	—	—
Liscomb Harbour	Spanis-ship point, station, near Pyes Wharf	45 0 28	62 0 43	8 0	6½
St. Mary River	Station 700 fathoms above Episcopal Church	45 6 12	61 57 42	8 0	6
Wedge Island	Beacon	45 0 36	61 52 22	—	—
Hollins Head	Station on summit	45 4 20	61 44 32	—	—
Country Harbour	Station opposite Widow point	45 14 42	61 46 41	8 45	6½
Isaac Harbour	Red head, station on summit	45 9 39	61 38 27	7 40	6¾
Harbour Island	Station on north-east point	45 8 25	61 36 18	7 40	6½
Green Island	Station, north side	45 6 23	61 32 35	—	—
Newharbour Head	Station on Nob	45 9 7	61 27 56	—	—
Shag Reef	Station on Rock	45 10 17	61 21 07	—	—

Place.	Particular Spot.	Latitude North.	Longitude West.	H.W. full and change.	Rise in Springs.
		° ′ ″	° ′ ″	h. m.	ft.
Berry Head - -	Station on extreme -	45 11 37	61 18 33	—	—
White Haven -	Observation station in Marshal Cove -	45 14 37	61 11 18	8 0	6½
White Head Island -	Lighthouse - -	45 11 58	61 8 2	—	—
Dover Island - -	Station on hill - -	45 14 11	61 2 57	—	—
Canso Harbour -	R. C. steeple - -	45 20 10	60 59 00	—	—
Canso Harbour -	Station on Cutler Island south-east extreme - -	45 20 42	60 59 02	7 48	6½
Ditto - -	R. C. church steeple -	45 20 10	60 59 00	—	—
Cranberry Island -	Lighthouse - -	45 19 49	60 55 29	—	—
Crow Harbour -	Station near entrance	45 21 6	61 15 29	8 0	6
Guysborough Harbour - -	Station on Hadley beach - -	45 23 4	61 29 00	8 20	6½
Ditto - -	Lighthouse, western side of entrance -	45 22 47	61 29 11	—	—
Cape Argos - -	Station on summit -	45 29 10	61 13 33	—	—
Eddy Point, Gut of Canso - -	Lighthouse - -	45 31 29	6 14 42	—	—
Sable Island - -	West flagstaff - -	43 56 24	60 2 50	7 30	4
Ditto - -	West extreme of grassy sand hills -	43 56 44	60 8 31	—	—
Ditto - -	East extreme of do. -	43 58 57	59 45 33	—	—

The longitude of Halifax Dockyard Observatory, by Captain Shortland, R.N., and Professor Bond with the Electric Telegraph, is as follows:—

	h. m. s.
Cambridge Observatory Massachusetts - -	4 44 30·6 West
Meridian Distance to Halifax by Telegraph - -	0 30 09·55 East
	4 14 21·0 West,

or Halifax Dockyard Observatory 63° 35′ 15″ West, which differs only 5″ from the longitude in this list.

The VARIATION of the COMPASS at various places on the shores of the Gulf and River St. Lawrence, determined in the years 1857–1860, by Commander Orlebar, R.N.

Place.		Variation. West.	Year.
		° ′	
Belle-isle - -	- Lark harbour - -	37 12	1859
Strait of Belle-isle	- St. Charles harbour -	40 15	—
	Henley harbour, Chateau bay -	38 38	—
	Red bay - - -	37 34	—
	Bradore harbour - -	35 37	—
North and West coasts of Newfoundland	Kirpon or Quirpon harbour - -	37 05	—
	Flower cove - -	36 52	—
	Cow Head - - -	33 32	—
	Cape Ray - - -	27 37	1856
ast of Labrador	- Wapitagun harbour -	32 17	1859
	Kegashka bay - -	31 07	—
	East Cape, Anticosti island	27 12	—
Cape Breton island	- Sydney harbour - -	24 40	1857
	Louisburg harbour -	24 38	1858
	Gabarus bay - -	23 56	—
Prince Edward island	Charlottetown - -	22 50	1859–60
Miramichi bay -	- Vin island - - -	21 24	1857
River St. Lawrence	- Quebec - - -	15 34	1859

The present annual increase in the Variation is about 4′ in the River St. Lawrence ; 5′ to 6′ on the coasts of Nova Scotia; 6′ in the Gulf of St. Lawrence ; and 7′ on the coasts of Newfoundland and Bell-isle strait.

The general direction of the lines of equal Variation in the River St. Lawrence and on the coasts of Nova Scotia is, N.W. $\frac{1}{3}$ W. and S.E. $\frac{1}{3}$ E. (true); Gulf of St. Lawrence, N.W. by W. and S.E. by E.; Newfoundland and Belle-isle strait, N.W. by W. $\frac{1}{2}$ W. and S.E. by E. $\frac{1}{2}$ E.

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